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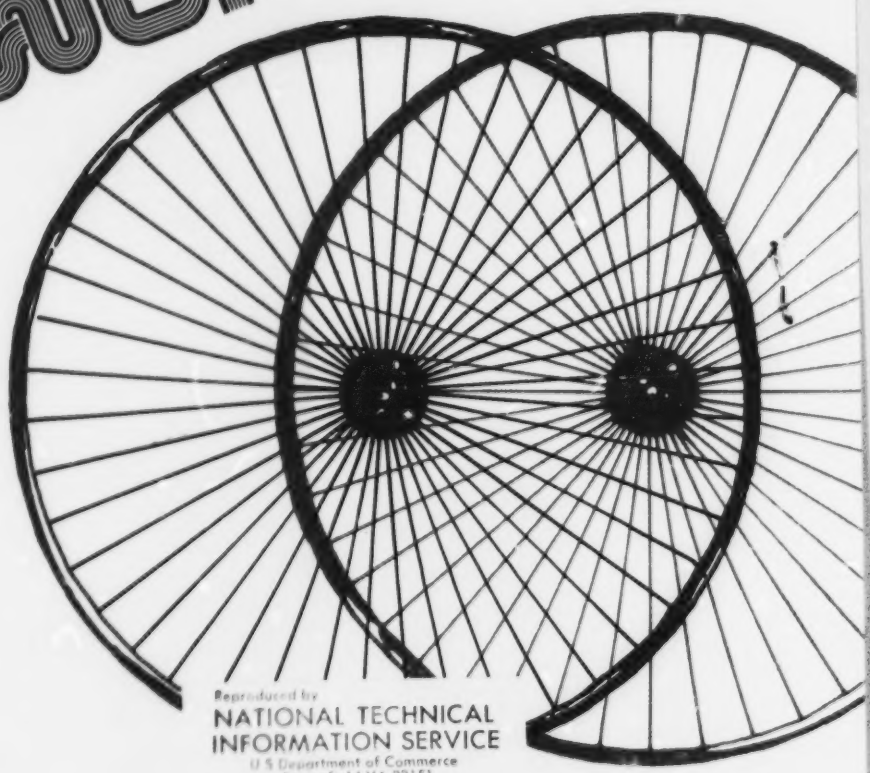

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Some of the findings of
the study are
following

I. SUMMARY

This report is a brief study of bicycle use as a practical transportation alternative in the United States and foreign countries today. It was conducted by the U.S. Environmental Protection Agency (EPA), Office of Planning and Evaluation. Drafts were submitted to other Federal agencies, OMB, and active bicyclists for comment. The major findings are summarized below and the conclusions and recommendations are at the end of the report.

America is experiencing an unprecedented boom in bicycle sales and uses. In 1972, bicycles outsold automobiles by 2 million (13 million versus 11 million).

Children and youths own the greatest number of bicycles. However, the greatest increase in bike use is presently occurring in the 17-40 age group. In 1972, about half the bicycles were sold to adults, a substantial increase over the 12 percent sold to adults in 1969.

The potential cyclist is confronted with significant advantages and deterrents to use of the bicycle.

Much of the general public does not fully appreciate the advantages the bicycle offers. The health and recreational benefits are substantial—cycling being often referred to as "perfect exercise." The bicycle offers mobility and, literally, door-to-door service at speeds comparable to auto travel in urban areas. At the same time, the bicycle is a relatively *inexpensive* form of transportation.

The major deterrents to cycling are high accident rates, bicycle theft, exposure to automotive air pollutants, insufficient support facilities (i.e., lack of bikeways, secure parking facilities, showers at places of work), and bad weather conditions.

The National Safety Council estimated that 1,100 cyclists were killed in 1973. One million bicycle injuries requiring professional and medical treatment occur each year. Furthermore, the accident rate is growing at about 15 percent per year. Most of these accidents involve collisions with automobiles, and in two-thirds of these cases the cyclist violated a law or safety rule. The vast majority of bicycle accidents involve children, though the proportion of accidents involving adults is climbing.

One of the better solutions to the bicycle safety problem is to separate the bicycle from motor vehicle travel as much as possible. This can be done by the construction of bikeways.

The term "bikeway" is a generic term encompassing the full range of cycling-related facilities—from fully separated facilities to those which are designated by signing only. Within the classification of bikeways, there are three distinct classes of facilities:

Class I: *Exclusive bikeways* are those in which a separate right-of-way is designated for the exclusive or semiexclusive use of bicycles. This bikeway

provides the greatest degree of separation between bicycles and other types of traffic.

Class II: *Shared bikeways,* or bike lanes, are those in which the right-of-way is shared with other forms of transportation and the cyclist is protected from conflicts either through pavement signing or physical barriers. This bike route is the most common type of bikeway used in American communities.

Class III: *Bike routes* are those in which the right-of-way is shared by the cyclist and other vehicles and are designated by signing only. This bikeway is the least desirable of the three from the standpoint of safety. However, a class III bikeway provides safer conditions for the cyclist than no bikeway at all.

Bicycle theft is a major problem, having increased 30 percent in 1971 alone. Last year an estimated half million bicycles were stolen. Thieves are encouraged by the fact that stolen bicycles are hard to identify and have resale values of $40 to $300.

Because cyclists usually must use road and highway rights-of-way, they are exposed to excessive levels of automobile generated pollutants, primarily carbon monoxide, hydrocarbons, lead, and asbestos particulates. In addition, the cyclist takes in larger quantities of these pollutants due to his elevated respiration rate. Medical evidence indicates that such exposure might increase the likelihood of respiratory diseases.

The above problems could be greatly reduced through better support facilities, both segregated bikeways and secure parking arrangements. In addition, such facilities would further promote bicycle use by improving the convenience of this mode of transportation. Indeed a major development would be to integrate the bicycle mode with mass transit through parking facilities designed to provide a "feeder" function.

A preliminary analysis by EPA suggests that increased use of bicycles in urban commuting could reduce auto vehicle-miles traveled (VMT) by 2 to 3 percent, and perhaps even more in those cities for which EPA has proposed very strict transportation controls. Furthermore, because of the low average speeds by the auto involved in the short trips and the potential high cost of driving, further research might show a much higher percentage of VMT reduction, resulting in increased amounts of gasoline savings and auto emissions reductions. Other environmental benefits include reduction of noise and congestion.

The Federal Government is beginning to recognize bicycles as a viable form of transportation. In the past, Government has generally viewed the bicycle as a recreational vehicle rather than from a broader environmental and societal perspective. Since 1971, the Department of Transportation (DOT) has been the leader in promoting the bicycle. DOT has allowed States to fund bikeways along federally funded roads with money from the highway trust funds. The new Federal-Aid to Highway Act of 1973 authorizes $120 million of trust fund monies to be used for bikeway construction over the next 3 years.

Other significant Federal agency activities are also underway. The Bureau of Outdoor Recreation and National Park Service are presently building limited

bikeway networks for recreation on Federal lands, and the Consumer Products Safety Commission has formulated a bicycle-design safety regulation. EPA has encouraged the use of bicycles as part of the Transportation Control Strategies to be employed in urban areas with high levels of automotive pollutants. And, finally, CEQ called together an ad hoc interagency committee to discuss the formulation of Federal policy on bicycles.

State involvement to date has been mixed, although interest in bicycle use is definitely increasing. Twenty-seven States are presently conducting research on the cost and benefits of bike facilities. Thirteen States have passed legislation promoting bicycle safety and facilities construction, while an additional 11 have such legislation pending.

Local activities have been restricted to a handful of localities; however, there is a trend toward building more bikeways. Davis, California, a university town, boasts that 40 percent of all downtown trips are traveled by bicycles, during the summer months when many students are out of town.

Europe is currently experiencing a resurgence in bicycle use after a marked decline during the postwar years. Environmental concerns, urban congestion, and high fuel costs are contributing to the new bicycle boom. Transportation planners in Europe see the rising interest in cycling as a harbinger of what is in store for them in the next few years. European countries—particularly Sweden, Denmark, Germany, and Holland—are actively promoting bicycle transportation by establishing separate rights-of-way, bicycle traffic lights, and pedestrian malls. Cyclists in Japan and China also enjoy nice facilities for bicycle transportation.

II. INTRODUCTION

The purpose of this report is to determine the potential role of the bicycle for transportation in the United States. This role has special significance given the energy shortage and current problems of air pollution. Energy shortages and more expensive fuel prices may induce citizens to reduce their travel or shift to modes with lower energy requirements. Thus, the bicycle may well fulfill these needs.

It is necessary to determine the effects and feasibility of the use of bicycle transportation by more people. This report investigates the feasibility of using bicycles as an alternative mode of transportation. To determine the potential for bicycle use, the report examines current trends of bicycle use in the United States, the conditions facing the American cyclist, the benefits and deterrents to bicycling, Federal, State, and local considerations affecting bicycle use, and the foreign bicycle experience.

III. BICYCLE USE IN AMERICA

This section discusses three topics: information on current and past bicycle sales, by use and types; ownership of bicycles, and the use patterns, including types of users.

A. Marketing Data

In the 6 years from 1965 to 1971, the number of bicycles in use increased 61 percent from 32.9 to 53.1 million (see app. I). Bicycle users increased from 35.2 million in 1960 to 75.3 million in 1970, and per capita ratio of bicycles increased from 0.13 to 0.25 during the same period.

Since 1970 the boom [1] has been even more pronounced. The Bicycle Institute of America estimates that 1972 saw 85 million users, or one bicycle rider for every two persons between the ages of 7 and 69. For the first time since the advent of the automobile, more new bicycles were sold than automobiles in 1972, 13.7 million versus 11 million. Sales more than doubled in 2 years; an increase of 65 percent occurred in 1972 alone over sales the previous year. In 1973, 15.3 million bicycles were sold.

The unprecedented boom has left manufacturers incapable of meeting the demand. For example, in 1971, the Schwinn Bicycle Company sold its entire 1971 production of 1.2 million units by May of that year.[2] Demand for vital component parts for domestic and foreign bicycles still exceeds supply today, despite dramatic plant expansion of both domestic and foreign plants this year.

Imported bicycles now account for over 50 percent of the market as compared to 40 percent over the last decade. Japan has the greatest amount of bicycle imports with about 29 percent of the total, followed by the United Kingdom and Austria.[3]

Total industry dollar volume for 1972 was estimated at $700 million, including bikes, parts and accessories.[4] About 85 percent of bicycle production has been geared to lightweight multispeed bicycles, priced at $60-$400, which rep-

[1] Much of the boom, at least according to the Bicycle Institute of America, has occurred as a result of bicycle industry efforts to promote bicycling popularity including product publicity, safety education, and community and public relations.

[2] *Atlantic Monthly*, November 1971.

[3] Bicycle Institute of America, Inc., "Some Facts About the Current Bike Explosion." August, 1972, p. 3. United Kingdom is 21 percent and Austria 14 percent of all foreign sales.

[4] Ibid., pp 1-2.

resents a dramatic change from the mid-1950's when 85 percent of production went to single-speed children's bicycles.

Projections indicate that by 1975 there will be 100 million cyclists in America and bicycling will continue to be one of America's fastest growing outdoor activities.[5] Bicycle sales may level off or even decrease slightly as the market becomes saturated with the more recent bike models, but use will continue to escalate.

B. Ownership

It has been a common understanding that bicycles are primarily for children. In the past, children were the dominant bicycle users. Recently, the bicycle has become an attractive mode of transit for the adult as well. Fifty percent of all bicycles sold in 1970-74 went to adults, whereas in 1969 only 12 percent were sold for adult use.[6]

One index of ownership is bicycles per capita. Although statistics of per capita bicycle ownership by age are not available for the entire Nation, a study completed for Ann Arbor, Michigan (a very large academic community partial to bicycle use), on bikeway development revealed the following:[7]

1. Bicycle use prior to school age is usually restricted by parents to areas very near the child's home. For this reason, ridership prior to age 6 is minimal.
2. Ownership rises sharply between ages 6 and 15. Ownership reaches its peak among 15-year-olds (0.7 bikes per capita).
3. Between the ages of 15 and 17 there is a pronounced decline in per capita bicycle ownership. This corresponds to a rapid rise in car ownership.
4. Bicycle ownership then levels off and remains fairly stable until about age 40.
5. There is a gradual decline in bicycle ownership in the 40 to 60 age group. Ownership becomes insignificant at approximately age 60.
6. The age span between 18 and 45 is where the greatest increase in bicycle use and ownership can be expected.

Other characteristics of race and sex are important determinants of who rides bicycles. Most surveys found bicycling a middle- to upper-class, predominantly white activity. Males of all age groups participate more than females, although the percentage of female cyclists is increasing.

C. Utilization Patterns

Bicycle users have been classified into the following four categories:

1. *The transportation-deprived* – children and the poor, who cannot afford other means of transportation.

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[5] Bureau of Outdoor Recreation, "Bicycle Speech Material" (Winter 1973).

[6] Department of Transportation, National Highway Safety Advisory Committee, "Bicycling as a Highway Safety Problem, Summary of Preliminary Findings, and Recommendations," unpublished memorandum, June 6, 1974.

[7] Haldon L. Smith, "Ann Arbor Bicycle Path Study" (Ann Arbor, Michigan) July 1972.

2. *Recreational users*–the pedalers who come out in fair weather for recreation on neighborhood streets and parks on evenings and weekends. Recreational use probably accounts for well over half the total miles of bicycle riding.

3. *Bicycle buffs*–a small but vocal group comprising the hardcore cyclists. They sponsor bicycle racing and long-distance tours, and generally lobby for cycling as a viable component of transportation networks.

4. *Utility users*–an increasingly large group of bicycle commuters, shoppers, and school or university travelers who make up a large percentage of all bicycle trips. The bicycle is also an effective mode for delivery (mail messenger services, etc.).

Several other surveys have been conducted around the country on use patterns. A recent study conducted in Lexington, Kentucky (a college town), suggests that 34 percent of trip destinations are school, university, or work, while 15 percent are for shopping.[8] Another survey of League of American Wheelmen Members in California indicated that 40 percent of their trips were recreational, while 23 percent were for shopping, 23 percent for work and 14 percent for school.[9] Further, a survey of members of bicycle clubs in the Washington metropolitan area showed that 43 percent attempt to commute regularly.

Other results of the survey indicate that, in the D.C. area, the average male respondent was 38 years old. The average female respondent was closer to 40 years old. This conflicts with the present presumption that the prime movers of the bicycle mode are college students and adults in their twenties. The assumption of younger participation may still prove true since the younger groups are probably less inclined than their elders to join an association or answer a survey.[10] In short, age breakdown for bicycle use is inadequate and in part conflicting, and further study and analysis are needed. However, it is obvious that the bicycle is being used more today than before and there is a great demand for bicycles. The environment in which the cyclist must ride will be discussed in the following section.

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[8] City Planning Commission, "Evaluation of Bicycling Facilities, Needs and Use" (Lexington, Kentucky, 1972).

[9] Institute of Transportation and Traffic Engineering, *Bikeway Planning Criteria and Guidelines* (University of Los Angeles, April 1972).

[10] Bernard W. Poirier, "Preliminary Analysis of Bicyclist Survey in Metropolitan Washington, D.C., and in California and Illinois" (June, 1973).

IV. THE CYCLING ENVIRONMENT

The decision to bike or not to bike is based on the advantages and disadvantages of bicycle use. This section examines these two facets of an extremely complex question of factors relating to bicycle use. The benefits and advantages are identified as reduction of air pollution, energy consumption and benefits to society and individuals. There are basically no ill effects or disadvantages to bicycle riding but there are deterrents and disincentives, which are identified as (1) the prospect of physical harm; (2) the unhealthy exposure to auto and other pollutants; (3) the probability of bike theft, (4) lack of segregated bikeways, insufficient intermodal access, and (5) other detrimental factors.

A. Benefits and Incentives

Before examining the potential reduction of air pollution and energy use, the bicycle's potential use as a transportation mode must be examined. Specifically, 40 percent of all urban work trips made by automobile are 4 miles or less. These short trips could easily be made by a bicycle at 13 mph in less than 20 minutes. At present, however, it is not possible to convert all these short trips to bicycles. As shown in a study of 500 motorists, conducted by the Philadelphia Coalition for EPA in June 1973, it was found that 38 percent of the bike owners said they would commute by bicycle if safe bikeways and secure parking were available. Of the non-bike-owners, 17 percent said they would buy a bike for commuting if there were bikeways and bike parking. According to the 1970 census, 44 percent of those who work in center city Philadelphia live within 6 miles of city hall. The EPA study revealed that with modest provisions for bicycle lanes and bike parking an estimated 5 percent to 10 percent of all those who commute to center city by auto could be diverted to bicycle commuting.[1]

This conservative estimate only includes those who live within the 6-mile radius. If some of those who live more than 6 miles away also converted to bicycle commuting, then the percentage would go up. The percentage would also increase if mass transit users were able to park their bicycles at bus stops and mass

[1] Ralph Hirsch, "Bicycle Commuting into Central Philadelphia" (Philadelphia Coalition and Drexel University, June 1973).

transit stations, or if they were able to carry their bicycle with them. The study also indicated that there would be a greater number of auto commuters converting to bicycling if there were more stringent restrictions placed on the auto.

Similarly impressive figures for the Washington metropolitan area have been crudely estimated. The Washington Area Bicyclist Association, the Council of Governments, and the D.C. City Council are all in agreement that, if personal safety and bicycle security problems were resolved, bicycle commuting would become acceptable to an estimated 44,000 people. Of this number, 8,000 could be expected to use their bicycles in the central business district (CBD).[2]

The construction of the Metro could allow mixed-mode transportation, so that an *additional* 66,000 persons would ride bicycles on segments of the trip to and from work. Of this number, 12,000 would use bicycles in the CBD.[3]

Further study and research are needed in this area to determine the accurate number of work trips that could be converted to bicycle transportation.

1. Energy Savings and Auto Emissions Reduction

This section will be divided into two parts—the first on the efficiency of the vehicle and, the second, the fuel savings and consequent auto emission reductions plausibly achieved by bicycle use.

a. Vehicle Efficiency. A bicyclist moving at 10 miles per hour uses only 97 Btu's per passenger-mile, and a pedestrian uses 500 Btu's per passenger-mile walking at 2.5 mph. The bicycle is efficient, both structurally and mechanically. A man's energy consumption with the aid of the bicycle as opposed to that consumed in walking a given distance is reduced to about 1/5. Therefore, apart from increasing his speed by a factor of three or four, the cyclist improves his efficiency rating to number 1 among moving creatures and machines, as demonstrated in figure 1.[4] When the bicycle is compared to other modes in the amount of consumption of energy per passenger-mile, the results shown in figure 2 are produced. (The figures used for bus, rail, auto, and aircraft are for intercity energy consumption.) Human transport (bicycling and walking) are 10-40 times as efficient as motorized transports.[5] The bicyclist traveling at 10 mph is reaching the equivalent of 1,000 passenger-miles per gallon of petroleum fuel.[6]

In terms of another index, the Vehicle Transport Efficiency, which represents the efficiency of the entire vehicle in carrying itself through its operating medium,

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[2] Washington Area Bicyclist Association, "Forecasts of Bicycle Usage" (Spring 1973), p. 1.

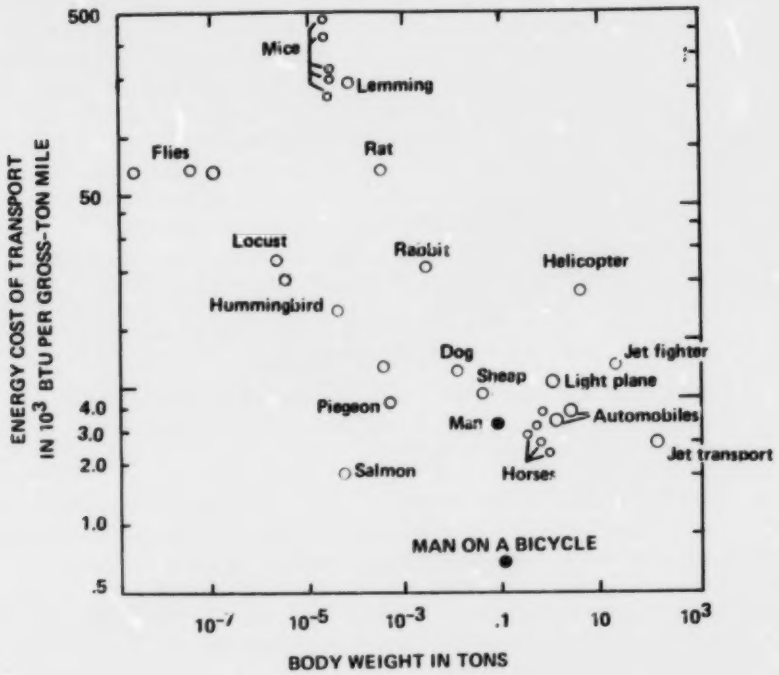
[3] Ibid.

[4] S. S. Wilson, "Bicycle Technology," *Scientific American* (March 1973) p. 82.

[5] Eric Hirst, *Total Energy Demand for Automobiles* (Society of Automobile Engineers, International Automotive Engineering Congress, Detroit, Mich., Jan 8-12, 1973, Inc: 1973).

[6] John E. Hirten, DOT, letter: "Transportation and Energy Conservation," (October 30, 1973).

the bicycle lies about in the middle between the least efficient mode, the "auto with driver" and the most efficient mode, the "supertanker," as shown in table 1.[7]



Graph data from article by S. S. Wilson, (Scientific American, March 1973)

Figure 1. Energy expended for moving creatures and machines.

b. Fuel Savings[8] and Emission Reductions. Two obvious spinoffs from significant bicycle use are reduced gasoline consumption and reduced auto emission

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[7] David Eggleston, "Toward a Dual-Mode Bicycle Transportation System" (presented at National Bicycle Symposium, Cambridge, Mass., May 7-8, 1973).

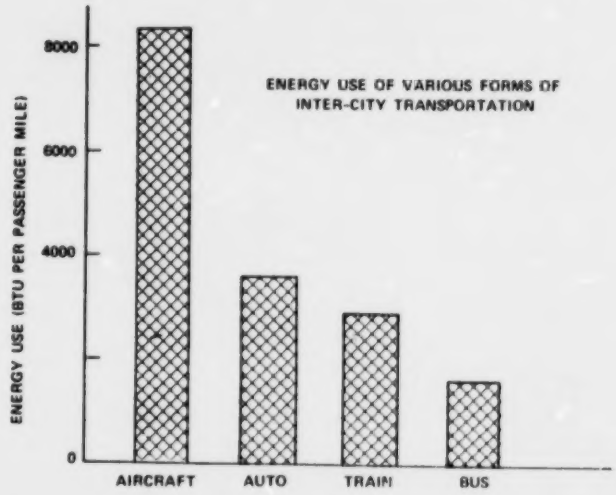
Vehicle transport efficiency is defined as:

$$VTE = \frac{(W)\ (V)}{P}$$

where

VTE = vehicle transport efficiency
W = vehicle gross weight
V = average speed
P = total installed power

[8] The estimated energy savings in this section were taken from two articles: "The Bicycle vs. the Energy Crisis," by Nina Dougherty in *Bicycling*, Jan. 1974, and "Energy Use for Bicycling," by Eric Hirst, for AEC, Feb. 1974.



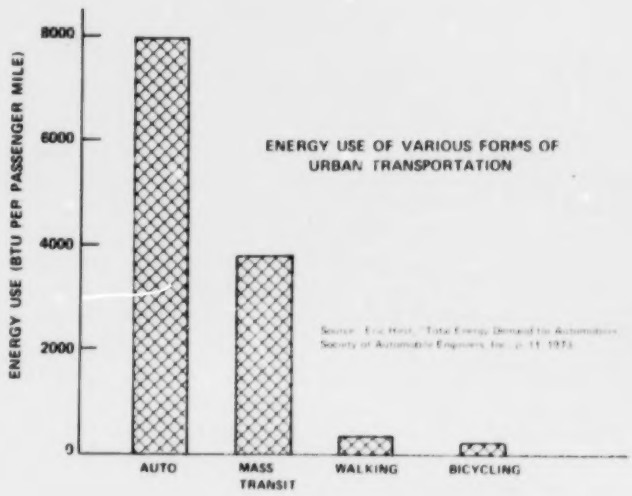


Figure 2. Various modes of transportation energy use.

TABLE 1.–Vehicle and payload transport efficiency

	Gross weight, tons	Average speed, mph	Installed power, hp	Vehicle transport efficiency (VTE)	Payload/ gross weight ratio	Payload transport efficiency (PTE)
Supertanker	200,000	20	40,000	533	0.90	480
100-car train	8,000	50	5,000	426	.65	277
Slow freighter	10,000	10	2,000	266	.76	202
Passenger liner	86,000	35	140,000	93	.26	24
Bicycle	.10	10	.1	53	.88	47
Large aircraft	375	600	70,000	17	.25	4.3
Mach 3 aircraft	250	2,000	335,000	8	.10	.8
City bus 3/5 full	13	0	225	6	.20	1.2
Auto with driver	2	0	150	2.8	.05	.14

levels. The objective here is to estimate fuel savings and auto emission reductions from bicycle use. Little research has been completed in this area, although the statistics for auto travel provide the jumping-off point. As documented in the 1963 Home to Work Travel Survey of the Bureau of the Census, 28 percent of all urban work trips are under 3 miles, and 54 percent are under 5 miles. However, according to the DOT Personal Transportation Survey of 1971, all trips under 5 miles represented only 11.1 percent of all vehicle-miles traveled.

The normal acceptable range for bicycle commuting has been assumed to be 4 miles per one-way trip. Theoretically and idealistically, if all urban trips shorter than 4 miles were converted to bicycle trips, roughly 8 percent of vehicle-miles traveled (VMT) would be curtailed resulting in 1.9 percent savings of the total energy consumption and 7.6 percent saving in energy consumed by transportation.[9]

Let us assume that one-fourth to one-third of all urban auto work-trips of this distance could be converted to bicycles, then 2-2.5 percent VMT reductions could be achieved easily. This means a savings of 0.4 percent of the total energy consumption in the United States a total of approximately 2½ billion gallons of petroleum saved. Short trips other than commuting work trips would be affected, and, assuming strict deterrents are applied to auto use, VMT reduction may conceivably reach 8 percent or possibly approach 20 percent. With the increasing cost of gasoline and shortage of energy in general, the EPA Transportation Control Plans for 36 metropolitan areas, and better intermodal integration, these assumptions seem plausible, although more research is needed in this area to determine accurate VMT reductions.

VMT reduction is the first calculation in estimating fuel savings as well as auto emission reduction. Although data are presently unavailable, cold starts, engine idling, and low average speeds may cause gasoline consumption and thus emission levels to exceed associated VMT.[10] Another factor is that most pollution caused by auto emissions exists in the urban areas where most short bicycle trips will be taken, thus bicycles will have a greater impact on air pollution

[9] Hirst, Eric. "Energy Use for Bicycling," for AEC, Feb. 1974.

[10] See *EPA, Compilation of Air Pollution Factors*, Feb. 1972.

reduction. Emission reductions could range between 2 and 10 percent, depending on bicycle use. Even a 1-percent reduction significantly contributes to meeting the legal requirements of metropolitan air quality control agencies for ambient air quality standards compliance. For instance, if a metropolitan area must reduce emission by 14 percent, the 1-percent emission reduction resulting from a switch to bicycles represents 7 percent of the required improvement. This demonstrates the bicycle's potential as a viable transportation control measure.

B. Benefits to Society and the Individual

Other less quantitative benefits occurring from bicycle use are reduction of congestion, noise and benefits to the individual.

Traffic congestion during rush hour is a common fact. If bicycle trips were substituted for motor vehicle trips, there would be very little congestion, since bicycles do not require much space.

Less space is needed for parking a bicycle also. Sixteen to 20 bikes can be parked in the space of an average American sedan. Other savings would be manifested in reduced need for on-street parking, additional highway lanes, and so forth. The cluttered urban environment would certainly become less congested.[11]

Noise pollution is disturbing to human activity, is annoying, and is physiologically and psychologically damaging. A major source of noise pollution in many urban areas today is traffic noise from roadways. Silence accruing from bike use provides a societal benefit as well as general personal benefit. Two senators recently returned from Mainland China to report that one of the most appealing facts of Chinese urban life was the absence of traffic noise. Only a swish of hundreds of bicycles can be heared at intersections. People enjoy bikes partly because they provide auditory correspondence between the cyclist and his or her immediate environment.

Another positive inducement to bike use is vehicle versatility. A bicycle can move in and out of traffic and can travel on sidewalks provided for pedestrians and cyclists, in unpaved alleys or in alleys where larger vehicles are excluded. It provides a freedom of mobility, not so much in long distance travel (as with the automobile), but in expansive exploration of the out-of-the-way places. The bicycle is one of the few vehicles providing door-to-door services which add to its convenience. And, on recreational trips particularly, conversion from the two-wheel to the biped mode is as easy as getting off the bike—no problem with finding space for parking.

The advantages of cycling are a bonus to the individual's health and welfare.

Exercise and health: In industrial countries cardiovascular diseases are the major killers for males under 65, and lack of regular vigorous exercise has been implicated by many investigators.[12]

[11] Mary Ness, Structural Engineer, interviewed, July 21, 1973.

[12] National Heart Institute, prepared by the Heart Information Center, National Heart Institute, National Institute of Health, *Arteriosclerosis*, A Report by the National Heart and Lung Institute. Task Force on Arteriosclerosis (Washington, D.C.; U.S. Government Printing Office, June 1971), p. 108.

Medical literature contains numerous reports on the physical and psychological benefits of bicycle training. These reports indicate that cycling offers a pleasurable way to—

- control body weight
- enhance the cardiovascular status
- develop a slower heart rate
- lower blood pressure
- increase strength and endurance
- improve the adequacy of the blood supply to the muscles of the extremities and the heart itself[13]

Recreation opportunities for cycling are great. Many cycling groups congregate with 10-12 members on the weekends to take long trips into the country for the day or for the whole weekend. Bicycling is a sport which the individual can enjoy by himself or herself and with a group as well.

As a transportation vehicle, the bicycle is less expensive than other modes of travel. The difference in cost of bikeway construction compared to highway construction is great. A bicycle path constructed over raw land (where a rough grading is required) costs approximately one-tenth as much as a secondary road. The costs of constructing a bikeway on the street or sidewalk average $1,000 a block and $10,000 a mile for a 8 foot width. Separated bikeways average $20,000 a mile, but it costs over $1 million dollars to build 1 mile of highway in a city. The cost of a new car is usually over $2,000, whereas the most expensive bicycle costs about $400. Bicycles sell for as little as $50. Even a good quality used car is expensive, and the maintenance and upkeep of a car are also very high compared to a bike. Bicycle repairs and maintenance average 0.2 cent to 2 cents per mile. Automobile drivers have to pay for maintenance of the car as well as for inspection, licenses, registration, driver's license, tickets, tolls, etc. Once a person has a bicycle, the only expenses are a possible voluntary registration fee from $2 to $5, fixing of an occasional flat tire, $2, and any extra equipment for the bike such as saddle bags, light, racks, etc., which are all under $10. Bicycle transportation is even cheaper than mass transportation by metro or bus. For example, urban bus fares for short distances range from 30 cents to 60 cents. The bicycle provides inexpensive transportation for nondrivers (poverty groups, children, and the aged). It gives them flexibility and speed in congested areas.

C. Deterrents

Many people are deterred from cycling for transportation because most of the current roads do not have special lanes for bicyclists and the cyclist is forced

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[13] H. K. Hellerstein, "Health Aspects of Bicycling" (Bicycles, U.S.A., Conference, Cambridge, Mass., May 1973), p. 1.

to compete with motor vehicles for a piece of the road. The lack of parking security for bicycles against theft is also a major deterrent. There are many others which will be discussed in the following section.

1. Personal Safety

Statistics show that the cyclist rides in a dangerous environment. The number of accidents, injuries, and deaths associated with bicycle riding has increased dramatically. While most bicycle accidents are caused by motor vehicle collisions, other accidents occur because of road obstructions, bicycle malfunctioning, inexperienced handling, traffic law violations, and lack of uniform traffic laws.

The National Safety Council estimated that 40,000 people were injured and 1,100 people were killed in bicycle accidents in 1973.[14] "Bicycle accidents are about 2 percent of the total fatal and 3.5 percent of the total reportable accident problems.[15] The problem is growing at an increasing rate of 14 percent to 15 percent per year.[16] Bicycle deaths are increasing at a faster rate than deaths caused by the automobile or any other mode. Between 1961 and 1971, bicycle deaths increased 70 percent nationally, while motor vehicle deaths increased 44 percent.[17] (See app. II.)

The cyclist, especially the commuter, is forced to ride on the road because of lack of bike paths. Most (71 percent) of the fatal bicycle accidents involve passenger cars.[18] A recent study conducted in San Diego found that 76 percent of bicycle-auto collisions occurred at intersections and another 11 percent resulted from the opening of car doors.[19] In addition, accidents occur because of road grading, pavement cracks and potholes, loose dirt and gravel, wet streets, and curbs and other fixed objects.[20]

The vast majority of bicycle accidents involve children, though the proportion of accidents involving adults is climbing. Many accidents occur because of the cyclist's inexperience and carelessness. The high percentage of accidents that occur before driver education age strongly supports the need for earlier bicycle education. Since the young bicyclist is a potential automobile driver, childhood vehicle safety education promoted by private and public entities would be helpful. The Bicycle Institute of America urges early education in both traffic regulations and proper riding techniques.[21]

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[14] National Safety Council, *Accident Facts*, 1973.

[15] Department of California Highway Patrol, Operational Analysis Section, *A General Bicycle–Motor Vehicle Study* (October 1971) p. 3.

[16] Ibid., p. 1.

[17] National Safety Council, p. 47.

[18] Department of California Highway Patrol, p. 5.

[19] Clifford L. Graves, "Summary of Remarks" (Talk presented at the conference, Bicycles, U.S.A., Cambridge, Mass.; May 7 and 8, 1973).

[20] James L. Konski, "Survival of a Rand on Neur" (talk presented at the Bicycles, U.S.A., Conference, May 7 and 8, 1973).

[21] Bicycle Institute of America, *Bike Safety*, Vol. 3 (September 1972).

One out of four bicycles involved in accidents are mechanically defective.[22] The Consumer Product Safety Commission (CPSC) published a set of standards for bicycles to improve this record. Another problem associated with bicycle use is that cyclists buy wrong sized bicycles which they are then unable to control.

Cyclists are not visible enough for many motor vehicle drivers, especially at night. Cyclists fail to use reflectors and lights and police officers fail to enforce the law. The CPSC standards require reflectors on all bicycles. Educational programs in schools and driver education classes would help cyclists to realize the importance of being seen.

It has been estimated that two out of three accidents occurred because the cyclist violated a law or safety rule.[23] Education programs and better law enforcement, especially at yield and stop signs, would make cyclists more aware of the hazards and necessity of obeying the law.

Finally, cyclists are forced to learn many traffic laws because they vary from State to State. For example, bicycles are not vehicles under the Uniform Vehicle Code and the law of 38 States as of January 1, 1972. Though a bicycle is a vehicle in 12 States, these laws make it clear that a bicycle is a vehicle only for purposes of rules of the road.[24]

These problems could be greatly ameliorated if decisionmakers established protected lanes and paths for bicycles away from traffic, eliminated obstructions in the roads, designed a safe bicycle, improved the design of intersections, established educational programs about safe bicycle riding, and enforced uniform traffic laws.

2. Bicycle Security

One of the most difficult problems a bicyclist faces is the lack of bicycle security. Based on reports submitted from 1,723 cities in the United States, the American Automobile Association estimates that over half a million bikes are stolen annually.[25] Bicycle theft accounted for 17 percent of all larcenies in the United States last year, and bicycle theft increased at least three times as fast as larcenies in general.[26] The FBI recently issued a report showing that bicycle theft increased by 57 percent from 1960 to 1971 and grew at the unprecedented rate of 30 percent in 1971. The cost of bicycle thefts for the 80 million owners must be phenomenal, for in California alone police sources valued stolen bicycles in 1971 at $22,300,000.[27]

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[22] American Automobile Association, *Special Survey on Bicycle Safety* (Washington, D.C., Revised November 1972).

[23] A. Trent Germano, et al. *The Emerging Need of Bicycle Transportation* (Georgia Institute of Technology; January 1973).

[24] Edward F. Kearney, "Bicyclists And Traffic Laws" (speech given at the National Bicycle Symposium, Cambridge, Mass., May 7 and 8).

[25] American Automobile Association, op. cit.

[26] Raymond N. Seakan, "Bicycle Theft: Counter Measures" (speech given at National Bicycle Symposium, May 7 and 8, 1973).

[27] Washington Area Bicycle Association, "Ride-on," Vol. II No. 2 (June-July 1973).

Based on the above statistics, it is obvious that bicycles are not safe from theft if they are not locked to something stationary. Even when they are locked up, bicycles can be stolen. Most cyclists go to great lengths to secure their bikes from theft with a lock and chain to a permanent post or bike rack. However, bike thieves can steal locked bicycles by cutting the chain or breaking the lock with wire cutters, wrenches, crowbars, hacksaws or boltcutters. Boltcutters are the most popular tool among bike thieves because of their strength and speed.

Bike thieves can easily resell stolen bicycles at lucrative profits, for three reasons: (1) stolen bicycles are very hard to identify and claim; (2) multispeed bicycles range in resale value between $40 and $300; and (3) there is a shortage of new bikes at most bike shops.

Increased police enforcement must be undertaken to reduce theft and resale of bicycles. Several new methods of security and identification are being implemented. These include improved security devices, secure parking areas, bicycle licensing, and police bicycle squads. There are two "theft-proof" locks now on the market which cost between $15 and $20. One is a U-shaped locking device that foils the closed jaws boltcutters. The other is a high alloy steel chain hardened throughout.[28]

Secure bicycle parking facilities are scarce and hard to find. As noted on the NBC TV news on July 25, 1973, cyclists in Washington, D.C., are having problems with parking garages. Many garages refuse to let bicycles park and others charge the bicycle the same price as a car. Even where bike racks are placed in front of security guards, bike thefts occur. In fact, this has occurred at EPA. Raymond Seakan, President of the Bike Security Systems, claims there are new bike racks available which offer the bicycle more protection for both wheels instead of only one in the old stlye racks. In some locations, attended parking garages check bikes in and out by a ticket. EPA and DOT have both applied this system. Conventional bike racks (unguarded) have been installed at most Government buildings in the Washington, D.C., area.

Other proposals are to fix bike racks with chains (that cannot be cut by bolt cutters) embedded in concrete at transit stations. The cyclist only has to provide the lock. Enclosed lockers at metro stations is another feasible innovation.

Once a bicycle has been stolen, recovery is quite difficult. Bicycle identification is extremely difficult because very few municipalities have mandatory licensing or registration requirements. Jay Townly, of Schwinn Bicycle Company, believes that local registration is needed because of the incidence of bicycles being stolen in one jurisdiction and sold in another. Interjurisdictional arrangements are needed; for example, California has a computer into which all local bicycle registrations are transmitted.

Until 1972, there were no required State bicycle licensing and registration programs.[29] In a statewide registration program every bicycle would be regis-

[28] Raymond N. Seakan, "Bicycle Theft: Counter Measure" (paper presented at National Bicycle Symposium, May 7-8, 1973).

[29] Jay Townley, "Bicycle Laws, Ordinances and Enforcement; Theft and Registration, The Past and Future State and Local Registration Programs" (speech presented at Bicycle Symposium, 1973).

tered with proof of ownership and serial numbers stamped on the frame for identification. Of course, the amount of success would depend on the number of States participating and the cooperation between States to catch bicycle thieves who cross State lines.

Other new program ideas for discouraging the resale of bikes is "Operation Identification" using driver license numbers and a nationwide bike registration system sponsored by the National Bicycle Dealers Association.[30]

Theft prevention also depends on law enforcement. Washington, D.C., has begun an "officer friendly" program where police officers on bicycles try to prevent crime and urge people to register bikes. Understandably, policemen have found that it is difficult to chase a bike thief in a scout car.

Attempts to solve bicycle security problems have been irregular throughout the United States. Although reasons for bicycle theft are being investigated, many more active programs are needed to prevent the growing number of bicycles stolen.

3. Exposure to Pollutants[31]

The cyclist is usually forced to ride directly in the highway right-of-way because of the unavailability of bike trails. Thus, he is exposed to a variety of air pollutants, high concentrations of which have proven hazardous to health. Further, the cyclist's increased respiration rate in this polluted environment compounds the ill effects.

Studies show that the cyclist who travels along heavily congested roads is exposed to air pollution higher than general ambient air in the area.[32] For example, carbon monoxide (CO) and nitrogen oxide pollution levels along many urban streets (at intersections) exceed present Federal standards of 35 ppm. "During periods of stagnant air in cities, curb-side levels between 100 and 300 ppm have been measured. Although levels drop off, CO readings may be high a block away from the road."[33] Also, there is basis for speculating that a person traveling along a busy road is exposed to particulate matter higher than the general ambient air. These particulates include lead, asbestos from brake linings and tire particles, and hydrocarbons emitted from motor vehicles. Other particulate matter lying along the road is mixed into the air by the air turbulence caused by the vehicles.

Convincing evidence points to deleterious effects of air pollution on general populations including increased morbidity from respiratory diseases.[34] While

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[30] Raymond N. Seakan, op. cit.

[31] The information presented in this section is from literature surveyed by Mike Everett.

[32] Arie J. Haagen-Smith, "Carbon Monoxide Levels in City Driving," *Archives of Environmental Health*, XII (May 1966), 548-551.

[33] Mike Everett, "Cycling in a Polluted and Congested Environment" (Workshop paper from National Bicycle Symposium: May 1973), p. 2.

[34] Ayres & Behler, "The Effects of Urban Air Pollution on Health," *Clinical Pharmacology and Therapeutics*, 1970, and U.S. Department of HEW, *Air Quality for Particulate Matter* (Washington, D.C., U.S. Govt. Printing Office, January 1969).

exercising in these higher concentrations of air pollution, the cyclist inhales these pollutants. Respiratory diseases, stomach cancer, and chronic emphysema occur at a higher rate among persons living in highly polluted areas than among persons who live in relatively clean areas.[35] This suggests that cyclists exposing themselves to high levels of air pollution may also suffer higher rates of diseases in the long run. Exercise appears to accelerate CO bonding to hemoglobin because of the relatively large volume of air and CO being passed through the lungs.[36] The health effects can be both acute and chronic. Bike paths and routes located away from heavily trafficked routes and cyclist education programs covering the effects of air pollution on health would help reduce this hazard.[37]

4. Lack of Bikeways, Support Facilities, and Intermodal Access

The bicycle is inexpensive, efficient, healthful, and nonpolluting, and it could be a great transportation vehicle. At present, however, there are not enough bikeways, support facilities, or intermodal access to exploit the bicycle's potential. The following discussion explains the drawbacks and provides suggestions for improvement and expansion.

a. Lack of bikeways. With the increasing use of and interest in bicycles in this country comes the need for pathways and routes where bicycles can be ridden with relative safety. With several exceptions, the majority of "bike routes" in the United States today consist of little more than signs which guide bicyclists along their routes and warn motorists of their presence.[38] A nationwide inventory by the Bureau of Outdoor Recreation indicates that throughout the country there are fewer than 3,000 miles of urban and suburban bikeways. There is, no doubt, a need for more bikeways.[39]

The main reason there are so few bikeways is the lack of resources allocated for bikeway construction. Bikeway construction is a low-priority item in State and local jurisdictions. Only in the last few years have some State and local jurisdictions allocated bond monies for bikeways as well as highway money. Only since 1973 have there been funds available to States from DOT under the Federal-Aid to Highway Act.

The "commuter" cyclist will advocate a route that is functional, while the recreational cyclist will support one that is isolated and scenic. There is, however, a unifying bond between both cyclists—a plea for protection from the automobile. The ideal plan would be bike routes, separated as much as possible from

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[35] Mike Everett, "Bike-Route Planning Strategies," (version of this paper published in *Parks and Recreation*, National Parks Association, Spring 1973), p. 5.

[36] James A. Vogel, et. al., ("Carbon Monoxide and Physical Work Capacity," *Archives of Environmental Health*, March 1972) found that subjects exercising and breathing air with 225 ppm CO developed a carboxyl-hemoglobin level of 20 percent which reduced oxygen approximately 24 percent.

[37] Mike Everett, "Bike Route Planning Strategies."

[38] State of California, *Bikeway Planning Criteria and Guidelines* (April 1972), p. 10.

[39] J. F. Rhinehart, "Bicycles and Parklands" (Panel remarks, presented at Bicycles, U.S.A., Conference, May 7 and 8, 1973), p. 7.

automobile traffic, which would serve the needs of both commuters and recreationists.[40]

Safety on bikeways is probably the most important issue at present. Locating bikeways away from all automobile traffic is not always practical or possible, especially for commuter trails. Therefore, adequate signing for both cyclists and motorists is necessary, especially at auto crossings.[41] (The National Park Service in the D.C. area now has bike-mounted police who patrol the trails and offer assistance with breakdowns and accidents.)[42]

Although bikeway construction is not as costly as highway construction, available money is rarely used for bikeway construction. The cost of bikeway construction ranges from 0 to an excess of $10 per linear foot. This construction cost does not include the cost of land acquisition, which is often the most costly factor.[43] These land acquisition costs can be reduced by the effective use of both abandoned and existing rights-of-way.[44] Also, recognizing their responsibility to make outdoor resources available to more people, private parties are sometimes willing to make their rights-of-way available for trail use.[45]

The type of surface best suited to bikeways is still in question. Porous gravel surfaces are ideal for water runoff, although the dust from these surfaces tends to cause wear on the most sensitive parts of good bikes and is a slower surface than asphalt. Porous gravel surfaces also require a great amount of maintenance and repair. A bad storm will destroy the path and make it costly to repair. The tow path in Washington, D.C., is a perfect example. Hurrican Agnes ripped up the path and it was 1 year before repairs began. In Denver planners discovered after careful study that a paved surface is much easier to maintain, is better for bikes, and is less expensive in the long run.

Maintenance of the bikeway is another expense. The National Park Service in the D.C. area is exploring the idea of maintaining bikeways through the use of volunteer "overseers" who would take care of minor maintenance problems of various sections of the trails.[46] However, this is impractical over a long period of time for many miles of paths because of the difficulties in acquiring volunteer help.[47]

b. Lack of support facilities. One of the most demanding concerns is for safe and adequate parking at access points along the trail or route. Increasing the number of access points helps reduce this, as does providing for the opportunity to bicycle to a particular section of the trail or route as opposed to driving to it. Rentals, restrooms, drinking fountains, and showers are all important facilities[48] which can increase the vitality of any commuter route or trail.

[40] Rhinehart, p. 5.
[41] Rhinehart, p. 5.
[42] Rhinehart, p. 9.
[43] Rhinehart, p. 10.
[44] W. C. Wilkinson, III, "On Building Bike Trails," National Park Service, 1973, p. 7.
[45] Wilkinson, p. 7.
[46] Wilkinson, p. 4.
[47] Wilkinson, p. 7.
[48] Wilkinson, p. 6.

Showers at places of work are much needed for the commuter bicyclist. Lifestyles have not changed sufficiently for supervisors and coworkers to accept a windblown, sweaty employee. Once the bike commuter arrives at work, a shower facility is needed close by for freshening up, and changing out of sweaty bike-riding clothes into appropriate clothing for work.

Of course, only when National Parks, State and local parks, and State, local and Federal governments feel that the bicycle is an *important* and viable transportation or recreational vehicle will money be allocated to build the needed support facilities mentioned.

c. **Lack of intermodal integration.** For trips of more than 5 miles, dual-mode transportation may be necessary. In this "time scarce" society, bicycle commuting more than 5 miles may take too long for the average person. Bicycle-automobile systems, bicycle-bus systems, and bicycle-mass-transit systems[49] are possible solutions to the long-distance problem; however, they are not being utilized to their fullest potential today.

The automobile and bicycle travel system does not appear to have restrictions on its application or feasibility.[50] The bicycle is a freer mixed mode commuting component than are car pools and peripheral parking. For recreational purposes, this system provides automobile mobility—a necessity for the weekend cyclists since public transportation accommodating cyclists is extremely limited. One problem which might arise is lack of inexpensive, safe, and conveniently located parking facilities for both car and bicycle.[51]

The bicycle-bus system is the most obvious possibility for integrating bicycles into dual-mode use in public transportation. It holds promise for average trip speeds more competitive with automobiles and for a large increase in potential ridership of a given bus line. To realize these improvements, bicycle-bus-route planning must take into account the unique capabilities of such a system.[52]

Some problems with the bicycle-bus system include storage volume required, access for loading and unloading, protection and restraints to avoid damage to bikes or other baggage, and ease and speed of loading and unloading.[53]

Generally, bicycles are restricted from passenger cars on trains and mass transit vehicles, with the possible exception of the folding bike. However, trains with baggage cars accept bicycles in their baggage service. Thus, train commuters requiring bicycles at both ends of their trip may be accommodated by trains with baggage cars or by having two bikes—one for the downtown station and one for the home station.[54] If downtown commuter stations rented bikes,

[49] Wesley Lum, "Bicycles in Mixed-Mode Travel" (Berkeley, Calif., University of California: April, 1973), p. 1. (presented at National Bicycle Symposium, May 7-8, 1973).

[50] Detroit could provide bicycle racks or optional equipment on motor vehicles.

[51] Lum, p. 8.

[52] David M. Eggleston, "Toward a Dual-Mode Bicycle Transportation System" (National Conference on Bicycles, U.S.A.: May 7 and 8, 1973), Cambridge, Mass., p. 9.

[53] Eggleston, p. 6.

[54] Lum, p. 8.

some bus trips, taxi trips or auto trips could be eliminated. Concern for safety and secure parking appear to be major deterrents to the cyclists and liability and expense deterrents to the railway.[55]

There are many possibilities for good intermodal integration of the bicycle and other transportation vehicles which could be fully exploited—if better bike parking conditions, feeder bike routes, and carrying space on vehicles were made available.

For the bicycle to be an accepted mode for an integrated transportation system, proper facilities will have to be provided for the bike rider. These facilities include safe bikeways, intermodal access and changing-shower facilities. The proper facilities for bike riders today do not exist in most places and thus bicycle commuting is not utilized as much as it could be.

5. Other Deterrents

The cyclist is faced with a few other possible difficulties which would deter many people from cycling to work, including inclement weather conditions, inability to carry additional packages, and time costs.

Inclement or very cold weather is a problem to the bicycle commuter. When the streets are wet, the brakes on the bicycle do not work well and this creates a safety problem. In very bad weather, the cyclist's exposure could precipitate colds. The solution to this problem is for the commuter to take the bus on bad weather days or wear protective rain gear when riding in bad weather. However, in very cold weather, bicycle commuting is possible. The cyclist is exercising and providing some body heat. With very warm gloves, a hat, thermal clothes, and thermal shoes, cycling can be pleasant in the winter. Although commuter cycling is possible in rain and cold weather, many people will not ride in those conditions.

Another problem when riding a bike is that of carrying personal property. Small amounts can be carried on a bike by (1) a knapsack on the cyclist's back, (2) carriers attached to the bike, (i.e., racks, paniers, or saddle bags), (3) the "bugger" attachment, which is similar to a shopping cart, has two wheels and rolls along behind the bike.

The overall cost to the bicycle commuter in terms of time and lack of convenience must also be analyzed.

In spite of the increasing popularity of bicycling, merely establishing bike routes will not necessarily insure a high rate of white-collar bicycle commuting to central business districts. According to a recent study[56] the present boom in bicycling on and around campuses as opposed to the general lack of cycling by postcollege adult commuters can be explained partially by the lack of economic incentives as well as the lack of bike routes for the latter type of commuter. On congested college campuses where commuting distances are short and student parking severely curtailed, the bicycle has become the fastest, most convenient,

[55] Lum, p. 6.

[56] "Commuter Demand for Bicycle Transportation in the U.S.," *Traffic Quarterly*, forthcoming.

and for many the most enjoyable form of transportation. For white-collar commuters, on the other hand, distances are generally over 4 or 5 miles, parking is still available in most business districts, and the necessity of changing into more formal clothing at work often makes the bike less efficient than the car even when exercise is considered an important byproduct of cycling.

If, however, the private automobile driver is forced to pay more of the social costs the auto imposes in congested areas, such as air pollution and traffic congestion, the price of driving will rise. Safe bicycle routes and other facilities such as locker rooms and bike parking areas, when coupled with such restrictions on cars, could stimulate considerable commuter cycling by white collar workers living close in. Even long-distance commuters may be induced to bicycle to work if mixed modal facilities such as park and cycle or mass transit and cycle facilities are developed. The study concludes that bike-route planners need to work bicycle facilities and trails into situations where economic efficiency considerations will be reinforced and not merely assume that construction of a bike route will call forth its own demand.

V. FEDERAL ACTIVITIES

In the past, the Federal Government has not given much attention to bicycles. However, because of the recent bicycle boom and the present need for new transportation alternatives, the bicycle is receiving more recognition and consideration in existing Federal programs, policies, and legislative initiatives.

A. Existing Federal Programs and Policies

While there is little legislative authority given to agencies by any bill, and while there is no national policy for bicycles, many agencies have studied the bicycle. The Environmental Protection Agency (EPA), Department of Transportation (DOT), Department of Interior (DOI), the Consumer Product Safety Commission (CPSC), Council on Environmental Quality (CEQ), and others have all been involved to some degree as summarized in table 4.

1. Environmental Protection Agency

EPA's activities have been limited but varied. Representatives were sent to (a) an interagency working group on bicycles sponsored by CEQ; (b) a bicycle symposium held in Washington in February 1973, sponsored by DOI; and (c) the National Bicycle Symposium sponsored by DOT and DOI. Bicycles were also briefly mentioned in EPA's 1972 Annual Report to Congress, *Progress in Preventing Motor Vehicle Emissions.* EPA has bicycle racks outside the lobby of the Headquarters Building at Waterside Mall in Southwest Washington, D.C., and in the garage. There is in operation a bicycle decal system for the security of employees' bicycles.

Section 201(f) of the 1972 Water Pollution Control Act is indirectly applicable to bicycles and could benefit bicycle users (see App. III). Under this section the Administrator is to encourage waste treatment management to combine the open space with recreational considerations. Careful preplanning, and design of sewer easements which parallel communities, rivers, streams, and water bodies could provide access for bicycle trails.

Sections 104 and 110 of the Clean Air Act Amendments of 1970 allow EPA to become involved in promoting use of bicycles. Section 104 of the Act gives EPA the authority to develop low-emission alternatives to present internal combustion engines. Section 110 requires States to submit plans for implementing the national ambient air standards in each State air quality region where transportation control measures are necessary to reduce the auto emissions. Bicycle use is to some extent being encouraged in these plans. The Provo, Utah, Spokane, Washington, National Capital Plans (D.C., Maryland, and Virginia), Denver, Colorado, Philadelphia and Pittsburgh, Pennsylvania, Transportation

TABLE 2.—Federal agency involvement in bicycle policy

Agency	Reason for concern	Legislative authority	Agency programs (active)	Related activities	Potential involvement
EPA	Environment (air pollution and energy saving)	1970 Clean Air Act, 1972 Federal Water Pollution Control Act	Office of Air Programs (Transportation Control Plans)	1972 Motor Vehicle Report, Participation in CEQ Interagency meeting. Participation in National Bicycle conference, Transportation Control Plans	Policy statement studies, funding installation of showers for bike commuters, publicity
HUD	Land use	Open Space Land Programs (701) Comprehensive Planning Assistance Fund	Limited		Bicycle parking facilities at public buildings
GSA	Parking Facilities at Government buildings	None	GSA policy on bicycle parking in Federal buildings		Revision of GSA policy of bicycle parking to require that secure bicycle parking and shower facilities be provided at Federal Government buildings
DOT	Transportation	1973 Federal Aid to Highway Act, Urban Mass Transit Act, National Highway Safety Act, Department of Transportation Act	FHWA, NHTSA, TES, UMTA	Cosponsored National Bicycle Symposium, 1973, Study of Bike Safety, allocation of $120 million for bikeways for 1974-76	Bicycle program office, more funding for bikeways

TABLE 2.—continued

Agency	Reason for concern	Legislative authority	Agency programs (active)	Related activities	Potential involvement
DOI	Recreation	1968 National Trails Act, Land and Water Conservation Act	BOR National Park Service	Cosponsored National Bike Symposium	Funding bike trails, support facilities
Consumer Products Safety Commission	Safety	Regulations of product	Bureau of Product Safety	Regulating bicycle design	Funding and enforcement
CEQ	Environment	NEPA	None	CEQ Interagency Work Group, 1972 annual report (mention of bicycles)	Funding, studies, coordination
D.C. government	Recreation, transportation, safety	None	None	Studies on use of bikes, bike safety, bike security	Bike demonstration city
D.C. Zoning Commission	Safety, transportation	None	None	None	Funding and rezoning for bikeways
National Capital Planning Commission	Safety, transportation	None	None	None	Bikeway planning
Smithsonian Institution	Exhibition	None	Traveling bicycle exhibition		

Control Plans include a close examination of measures to promote the use of the bicycle. In the preamble to its notice of June 22, 1973, publishing the approval/disapproval notices, EPA mentions bicycles as one means of reducing the number of miles traveled in automobiles in urban areas: "Alternative transportation capacity . . . exists in the possibility that many short trips now made by car could be made by bicycle or on foot."

The Denver, Colorado, plan includes an integrated strategy for bicycle use, the results of which are projected to reduce emissions by 1 percent by 1975. The plan calls for a pilot bicycle route to be built as a first step to indicate how a prospective system of 164 miles might work. Total implementation costs are estimated at $800,000 to $900,000. A bicycle license fee of $5 for 2 years would be levied to cover the costs.[1]

As a result of testimony by citizen groups at public hearings, the final plans for the National Capital Area (D.C., Maryland, and Virginia) also require an integrated strategy for bicycle use, resulting in a reduction of emissions by 1 percent by 1976. The plan requires establishment of 180 miles of exclusive bicycle lanes by July 1, 1976. The plan also requires a pilot bicycle route from Key Bridge along Pennsylvania Avenue to the White House to the Capitol to Alabama Avenue, S.E.; a comprehensive demand and use study; and a system of secure bicycle parking racks for any facility which now provides auto parking.

EPA announced on November 20, 1973, at the press conference for the Transportation Control Plans for the National Capital that "bicycling can divert a significant amount of auto traffic, especially for short trips of four miles or less . . . . We believe that, if bicycle lanes can provide safety and security as well as convenience to work or to subway stations, people will ride them. We also feel that bicycle security –in parking and in riding–should be provided."

2. Department of Transportation

DOT has been the leader and the most active agency in promoting the bicycle since early 1971, when Secretary of Transportation John A. Volpe and Secretary of Interior Rogers C. B. Morton made a joint decision to promote bicycling. Secretary Volpe mentioned the bicycle alternative in many speeches in 1971, particularly the inauguration speech for Transportation Week, May 16, 1971, in Washington, D.C.[2] DOT has shown interest in almost every aspect of bicycle use, although efforts to integrate bicycles with other modes of transportation have been slow.

Four offices within DOT have developed complementary programs on bicycle use. These are the Federal Highway Administration (FHWA), the Office of the Assistant Secretary of Transportation for Environment, Safety, and Consumer Affairs (TES), the National Highway Traffic Safety Administration (NHTSA), and the Urban Mass Transit Administration (UMTA).

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[1] "Denver Transportation Plan," Denver, Proposal submitted to EPA, June 1, 1973.

[2] Department of Transportation and Department of Interior, *Bicycling for Recreation and Commuting*, (Washington, D.C.: U.S. Government Printing Office, 1972), p. 6.

a. Federal Highway Administration. The Federal Highway Administration (FHWA), in addition to updating PPM 20-23[3] in the form of a transmittal (app. IV), is participating in the preparation of a report to Congress due January 31, 1975, on bicycle safety. The Office of Highway Safety is currently drafting a highway safety standard that will require each State to provide adequate and safe facilities for bicyclists as an integral element of its community planning and highway transportation system. The FHWA Office of Research is continuing its interest in the nonmotorized transportation field. It will be examining the concept of citizen acceptance of alternative modes of transportation, and the economic tradeoffs between walking, bicycling, using mass transit, or driving a private automobile. Lastly, the planning office is publishing a brochure that will inform States and local communities of the ways and means of funding bikeway planning.

b. Office of the Assistant Secretary of Transportation for Environment, Safety, and Consumer Affairs. TES has launched a number of activities related to bicycle use, including the following: gaining information on bicycle programs in 10 U.S. cities; issuing a memo setting forth the conditions under which trails for bicyclists and bikers may be constructed with Federal money; completing a contract with BART to demonstrate the integration of bicycles with mass transit; funding with UMTA and NHTSA of a community planning manual on bicycle facilities; and providing leadership in planning DOT's national bicycle symposium in May 1973.

c. National Highway Traffic Safety Administration (NHTSA). NHTSA is involved with the emerging bicycle safety problem. It has primary responsibility for the bicycle safety report due to Congress January 31, 1975. Its Research Institute is studying pedestrian and bicycle accidents including causes, types, and prevention. And its Traffic Safety Program has proposed a revision of its Highway Safety Program Standards, which include bicycle and pedestrian traffic.

d. Urban Mass Transit Administration (UMTA). UMTA has contracted with Washington's Metro for a demonstration project on bicycle access and parking facilities. Other contracts for bicycle use complementing mass transit systems are also being considered.

3. Department of the Interior

The Department of the Interior has also been active in promoting bicycles since early 1971. Emphasis in this agency is on recreational use of bikes. Two offices explicitly provide for their use: the Bureau of Outdoor Recreation and the National Park Service.

a. Bureau of Outdoor Recreation (BOR). The National Trails Act is the main mandate for BOR involvement. Enacted in 1968, it has helped to establish

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[3] Dept. of Transportation/FHWA, *Federal Aid Highway Program Manual*, 18 (March 8, 1974.

better conditions for cyclists; however, its full potential has not yet been realized. More specifically, it (1) encourages States to consider establishing bicycle (and other trails) on public lands in or near urban areas; (2) provides for adding urban trails to the national system; (3) provides for interagency cooperation on bike trail development on abandoned property; and (4) allows planning for bicycle use on some sections of National Scenic Trails Systems.

The Bureau provides matching grants to States and local jurisdictions of approximately $300 million per year for recreational facilities including bikeways. Despite this impressive amount, the California legislature has found that State and local agencies do not always seek available Federal funds under this Land and Water Conservation Fund (LWCF).

Other BOR activities include sponsoring bicycle symposiums, disseminating information on utility transportation rights-of-way abandonment, and reviewing environmental impact statements for inclusion of bike trails.

b. The National Park Service. The National Park Service has also played an active role by sponsoring bike-related activities and establishing new miles of bike trails. Rock Creek Parkway and Mount Vernon trails in Washington are two of their projects. In 1971, the Park Service classified 232 miles of trails within its parks as being suitable for bikes. The Park Service declared 1973 the "year of the Bike."

4. Consumer Products Safety Commission (CPSC)

CPSC's concern is for providing a safe vehicle for children to ride. A set of standards was initiated because more than 1 million bicycle-related accidents occur annually. The purpose of these standards is to provide children less than 16 years of age with a safe vehicle. The regulations are aimed at mass-produced bikes to affect the standards of equipment and accessories on the bike as it goes into the user's hands. Specifically, these standards impose minimum strength requirements on brakes, steering systems, frames and other bicycle components sold in the United States after January 1, 1975. Manufacturers will be required to provide wide angle reflectors to increase visibility at night, chain guards on nonfreewheeling pedal systems and fenders without sharp edges. In addition a 4-mile road test and an instruction manual explaining how to assemble the bicycle and maintain brakes and tires and other basic elements are required.

5. Council on Environmental Quality (CEQ)

CEQ mentioned bicycles in its *Third Annual Report* as a possible alternative mode of transportation in national parks. In 1973 an ad hoc interagency working group convened at CEQ's request for the purpose of formulating Federal policy on bicycles. This working group discussed incorporation of bicycle planning specifications in existing programs, funding of bikeways, action on bicycle theft,

traffic safety, initiation of technical research and development, and the designation of Washington, D.C., as a "model bicycle city."

6. General Services Administration

The General Services Administration has the potential of having a very positive impact for the security of Government bicycle commuters' bikes because of its governmentwide responsibility to maintain Federal facilities. This responsibility lends itself best to work-space modifications, new construction and leasing design standards, and other public building activities in providing facilities for bicycle commuters at places of work.

Pursuant to memoranda circulated by the Federal Energy Office (FEO), the General Services Administration has issued several temporary Federal property management regulations—the last being issued May 22, 1974—to be followed shortly by a permanent regulation. These regulations address Federal employee parking and require, among other things, that agencies reserve areas within parking facilities for the use of bicycles. This regulation requires that: Bicycles be "given special consideration, and the number of parking spaces reserved for bicycles and two wheeled vehicles shall be reevaluated every 6 months."

7. Housing and Urban Development

HUD has two grant programs under Community Development, Department of Housing and Urban Development, which may be applied to bikeways and other forms of recreation. Urban Renewal Project programs are designed to provide assistance for rehabilitation of slum areas, authorize land acquisition and construct improvements including streets, sidewalks, and recreational areas. Bikeway systems could be developed under these provisions. Grants may range from $800,000 to $40,000,000 with 2/4 or 3/4 funding coming from the Government.

HUD also encourages and aids communities in acquiring permanent open space land for growing urban recreational demands under its Open Space Land Programs. Roadways and landscaping may come under the egis of this program. Applications are made to the State agency administering the program in the usual manner. Although bikeways are not specifically mentioned in the program description, there is nothing discouraging their development. These are 50-50 grants and have ranged from $4,900 to $2,500,000. This program, as of the writing of this report, is inactive.

Funding for bikeway system planning may be sought through the HUD Comprehensive Planning Assistance Fund ("701"), especially if sought as part of a city- or countywide comprehensive planning effort.

Local governments may choose to expend general revenue sharing funds on the acquisition or development of bikeway rights-of-way.

8. Other Federal Programs

A survey of Federal Programs done for the California Legislature shows that approximately 260 Federal programs administered by 92 separate Federal

entities could, in theory, provide funding for bicycle trails. However, after investigation, the California Legislature found that very few of these 260 programs translate into bike-related dollars and cents.

DOT also listed a number of Federal programs which could be used to plan or develop urban, suburban, and intercity bike routes of various types—shared roadways and grade-separated pathways (see app. V).

B. Legislative Initiatives

Attempts in 1971 and 1972 to obtain funds for bikeways through legislation were only mildly successful. The Bicycle Transportation Bill of 1971 and 1972 and the Federal-Aid to Highway Bill of 1972 failed to pass or even get out of conference. Also, two other bills were introduced in Congress, one dealing with abandoned rights-of-way and the other with installing bicycle racks. However, neither of these bills passed.

The Federal-Aid to Highway Act of 1973 which supersedes the PPM represents one of the most significant commitments to bikeways anywhere in the Federal Government. The main provisions are:

(1) $40 million may be obligated annually by the Federal Highway Administration (FHWA) for bikeway and walkway purposes during fiscal years 1974 through 1976. The money can be spent on planning, preliminary engineering, inspection, construction, or reconstruction. No more than $2 million can be obligated to any State in a single year. The percentage of Federal funding participation will be 70 percent.

(2) Addition of bikeway provisions to the United States Code, Section 231 of the Act requires that the Secretary include provisions for bicycle safety in his uniform standards governing State highway safety programs.

(3) Section 231 requires that State highway safety programs include driver education programs which provide for research and for greater cyclist safety.

(4) Section 214 calls for a study of bikeway safety. The research is to be completed by January 31, 1975, and the study is now underway at DOT and it is expected to meet the deadline. It is to include:

   (a) Evaluation of State laws, ordinances, enforcement policies, and capabilities of enforcement.

   (b) Investigation of alcohol and bikeway safety.

   (c) Evaluation of methods to improve State bicycle safety programs.

(d) Assessment of present funding allocations for bicycle safety programs and future capabilities of government at all levels. (This provision authorizes $5 million for the study, which is also to subsidize a simultaneous pedestrian walkway study.)

VI. STATE AND LOCAL ACTIVITIES

A. General Survey

State governments appear to be concentrating their efforts in the areas of research, development of planning and design criteria, and funding for local systems. Twenty-seven States are conducting bicycle research; 13 States have passed related legislation; and another 11 have such legislation pending. Finally, 13 States have prepared planning and design criteria.[1] State funding of bikeways and other facilities has generally been quite limited. Notable exceptions are Oregon, Michigan, Washington, and California, all of which have passed legislation allocating a fixed percentage (usually 1 percent) of all gasoline tax revenues for investment in bicycle facilities.

B. Some State and Local Efforts

Several State and local government efforts deserve special recognition. They have taken a progressive attitude to bicycle use and provide examples for others to emulate.

1. State Efforts

(a) *California* has been the leader with at least 37 cities and counties having existing bicycling facilities and with 20 other systems being planned. Davis, California, is one of the best examples of viable bicycle transportation systems where 60 percent of all rush hour traffic is on bicycles.[2]

(b) *Florida,* the next most active state, has 20 existing systems and 5 in the planning process.

(c) The Midwest States of Indiana, Illinois, Ohio, Michigan, and Wisconsin have all taken large strides in the implementation of bicycle facilities. Collectively, these States have at least 51 existing bicycling systems and 15 more in the planning stage.[3]

(d) *Oregon* has enacted legislation (H.B. 1700) which has provided a model to many States. The Act states:

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[1] A. Trent Germano, et. al., *The Emerging Need of Bicycle Transportation* (Georgia Institute of Technology. January 1973).

[2] Doug Adler, Administrative Assistant for Congressman Koch, Interview, July 1973.

[3] Germano, op. cit.

> Footpaths and bicycle trails should be established wherever a highway, road or street is being constructed, reconstructed or relocated. Funds received from the State Highway Trust Fund may also be expended to maintain such footpaths and trails; to establish footpaths and trails along other highways, roads and streets and in parks and recreation areas . . . . The amount expended by the commission or by a city or county as required or permitted by this section shall never in any one fiscal year be less than one percent of the total amount of the funds received from the highway fund.[4]

(e) *Arizona* recently passed a bicycle study bill on a statewide basis from which $50,000 was appropriated from the general fund for the highway department to administer.[5]

2. Local Efforts

The city of Davis, California, is probably the best example in the United States of the bicycle's being used as a major transportation mode, almost equal to the auto. California's climate provides ideal conditions for bicycle riding and the city-built bicycle path network makes it possible for the bicycle to be used safely as a regular transportation vehicle.

Davis's population of 24,000 own 18,000 bicycles. No other city in the United States has such a high proportion of bicycle ownership—and in Davis, "owning" means "using."[6] "On one heavily travelled street, traffic counts during the summer (with few university students in town) revealed that bicycles represented 40 percent of all rush hour traffic; 90 percent of all riders were adults."[7]

Davis, California, lends itself to bicycle riding because of its mild weather, flat terrain, wide streets, a collegiate town's age breakdown, and a majority of the population living within 2 miles of downtown and campus. Equally important, Davis has adequate bike lanes and paths.

Over the past 8 years, Davis has had authority to promulgate bicycle regulations. Before 1967, the City Public Works Department made plans to create bike lanes over 5 feet wide on the shoulders of the streets. Then the passage of the California Motor Vehicle Code in 1967 permitted the Davis City Council to build bike lanes and regulate bike traffic. The plan called for 12 miles of bicycle paths by 1974, including 5 miles of lanes completely separated from the roadway.[8]

The high percentage of commuters that ride bicycles on the bikeways has provided the city with less rush hour traffic, almost no parking problems and the separated bikeway system has reduced auto-bicycle accidents.[9]

The City of Chicago and its suburbs have some of the best bicycle paths removed from motor vehicle routes in the country. Over 100 miles of pathways,

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[4] Ibid.

[5] Ibid.

[6] Robert Sommer and Dale F. Lott, "Bikeways in Action: The Davis Experience" (The Bicycle Institute of America, 1973).

[7] Ibid.

[8] Ibid.

[9] Ibid.

all paved in some manner, wind through forest preserves, along the shore of Lake Michigan, and across virgin prairies. The Chicago Park District Lakefront Bicycle Path is an excellent commuter path for those living a short distance from the lake shore either north or south. The most extensive of the bicycle paths is the DuPage Prairie Path which extends over 20 miles through the western suburbs of the city from Elmhurst to Elgin and Aurora. The Green Bay Trail provides a quick way of traveling through Chicago's northern suburbs to the outskirts of Evanston.

It is worth noting that as of October 1971 the City of Chicago had 26 bicycle lots of various sizes, all in the central downtown area. Chicago is experimenting with rush hour commuter bike lanes in the Loop on a limited basis.

Local initiatives in jurisdictions include:

- In April 1973, the City of Ann Arbor, Michigan, passed an $850,000 bond issue to provide an immediate 91-mile bike commuter system.
- Denver citizens voted approval of a $300,000 bond issue earmarked for bikeways in the fall of 1972. Also, partially with BOR assistance, the city created another bike system (along Cherry Creek).
- The D.C. Police Department recently instituted the Friendship Force which now has 10 bicycle-mounted police on patrol.

This coverage of State and local government activity is incomplete due to the constantly changing state of the art. All activities on the State, local, and governmental levels have been for providing better conditions for cyclists and thus eliminating the deterrents. For more information on the status of the 1973 State Bikeway Legislation and the State activities in bikeway development across the country see appendix VI.

VII. FOREIGN EXPERIENCE

A. Europe

Because of the expense of automobile ownership and use plus the prevalent crowded conditions, extensive bicycle use has been an accepted fact in Europe since the bicycle was first introduced. Today the bicycle is being used even more extensively because of the energy crisis. Cars were banned from streets in seven countries on Sundays during the 1973-74 winter. In some areas, such as Copenhagen in Denmark, Upsala in Sweden, Rotterdam in the Netherlands, and Stevenage in England, bicycles account for as much as 43 percent of all the trips made by any form of transportation.[1] In order to accommodate cyclists and promote the increased use of bicycles, many areas have constructed special facilities.

The prime cycling countries are France, England, and Holland, in that order. France and England have a vast network of secondary roads with villages well spaced so that no ride puts one very far away from important necessities such as food and lodging. There are also detailed regional maps available for both countries. Holland has a well-known network of bicycle paths as well as a good secondary road network. Gary J. Hawkins, co-author of *Bicycling Touring in Europe,* claims that Scotland, Wales, Northern Ireland, Ireland, Belgium, Germany, Denmark, Sweden, Norway, Switzerland, Austria, and Italy are good cycling countries. The marginal cycling countries are Spain, Portugal, Yugoslavia, and Greece.[2]

In 1973, bicycles manufactured in France totaled 2,250,000; 1,800,000 were sold in France and the rest were exported to other countries (the United States was the largest customer importing 346,752). The laws applying to bicyclists are the same as those applicable to motorists and there is no limit on the age for bicyclists. Deterrents are present in France but some effort is being made to overcome them. In 1974 an appeal was made to the mayors of all cities and towns in France to update traffic laws to encourage bicycle use and, as a result, Lyon, Troyes, and Grenoble are planning to review and improve their present traffic laws. Some countries are planning to build special paths for bicyclists, but no definite plans have been presented.[3]

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[1] A. Trent Germano, et. al. *The Emerging Need of Bicycle Transportation* (Georgia Institute of Technology: Jan. 1973).

[2] Gary J. Hawkins, "Finding Europe's Sideroads," *Bicycling* XIV, (July 1973). 26-28.

[3] American Embassy, Paris, Airgram to EPA (Feb. 1974).

There are 12 million bicycles in the United Kingdom.[4] It is permitted to bring a bicycle on the train, lock it and pay half fare for the bicycle. In Stevengage and Peterborough, bikeways are being provided as part of a new town development. Twenty-three miles of bikeways have been constructed with 90 underpasses designed to segregate cyclists from cars at intersections. The bikeways are 12 feet in width for two-way traffic with light construction, surfaced with bitumen or tar macadam and have minimal lighting and drainage. Grassways separate the paths which run parallel to the road but there are several crosstown cycleways not paralleling roads. About 11 percent of the population in Stevenage use the bicycle for local trips to shops and places of work. Approximately 8 percent of the primary school children (5-11 years of age), and 17 percent of the secondary school children (11-16 years of age) cycle to school regularly.[5]

The British Cycling Bureau in London claims there are two deterrents: the weather and the danger of cycling in traffic. The Bureau states that weather is more of an emotional than a real problem. Campaigns to persuade local authorities to provide separate facilities for bicycles in urban and rural areas are being conducted and meeting with some success.[6]

Holland has separate roadways for bicycles with underpasses and traffic signals. Extensive parking facilities are available in shopping and business areas. In December 1971, Holland had 30,000 kilometers of bicycling roads—one-third of the total road length for cycling.[7]

In Holland and Sweden, a commuter may check his bicycle at a train station and rent another at his destination. Bicycles are available at 90 stations in Holland and 705 in Sweden. All government buildings and most banks provide secure bicycle parking under the building with an attendant to guard the bike.[8] Holland also has special bicycle facilities on trains which enable the cyclists to take their vehicles with them.[9] Holland, Denmark, Sweden, and Finland all have comprehensive bicycle plans which will be implemented in the next few years. In Holland many functional service roads are used as bikeways.

The Federal Republic of Germany has 15,000 kilometers of cycling roads.[10] Many cities throughout the continent have extensive systems of bicycle lanes

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[4] American Embassy, London, Airgram to EPA (Feb. 1974).

[5] Department of the Environment letter to the U.S. Embassy in London (Jan. 11, 1974).

[6] British Cycling Bureau letter to U.S. Embassy in London (Dec. 31, 1973).

[7] "Bicycling for Leisure Fun Growing Rapidly in Japan," *WLRA Bulletin*, XVI, (Sept.-Oct. 1973).

[8] Steve Hudak and Cary Shaw of WABA, Interview, July 1973, of their bicycle trip to Europe, June, 1973.

[9] Robert Somner and Dale F. Lott, "Bikeways in Action–The Davis Experience" (presented as a public service by the Bicycle Institute of America, 1973); and Wesley Lum, "Bicycles in Mixed-Mode Travel" (produced as part of a program of Research and Training in Urban Transportation sponsored by Urban Mass Transportation of the Department of Transportation, April 1973).

[10] "Bicycling for Leisure Fun Growing Rapidly in Japan," *WLRA Bulletin*, XVI, (Sept.-Oct. 1973).

separated from the highways and many metro stations have large protected bicycle parking areas.

In Rome, there are an estimated 12 million bicycles with estimated sales over 1,000,000 a year since 1968.[11] Although the same deterrents to use exist in Rome as in the United States (accident and theft rates and lack of support facilities), bicycles were the only mode of transportation allowed on the roads on Sunday last winter, 1974. There was a ban on Sunday and holiday motor vehicle traffic including motor bikes, scooters, and motorcycles for purposes of conserving energy.

In response to an EPA airgram sent to the Swedish Embassy requesting information on bicycle transportation, the following facts were given:

(1) A poll taken in 1965 indicated that about 62 percent of the Swedes aged 15 to 75 years possessed their own bicycles (3 million in 1965). From 1966 to 1972, increasing numbers of bicycles were sold (394,000 in 1973).

(2) The increasingly negative aspects of car traffic and growing public interest in physical fitness have led to a renaissance of the bicycle in Sweden since late 1960. The energy crisis will obviously lend added momentum to the trend.

Sweden recently began to institute comprehensive arrangements for bicyclists, and Copenhagen and Stockholm already have separate bicycle paths.[12] Many other cities, such as Oxelosund, are constructing auto-free malls in the center of town with access for cyclists and pedestrians.[13] Sweden's "modal-split" transportation plan provides for separate lanes for every mode of transportation. In Landskrona, for instance, the bicycle time is 6 minutes (30 percent) less to the town limit than that by bus or auto.[14]

Bicycle accidents in Europe pose a problem basically because of the number of cyclists. However, the accident rate is much lower where bikeways are provided. A French survey has found 45 percent fewer accidents on bikeways, and in Copenhagen 60 percent fewer accidents are reported. The theft rate in Europe is also rising rapidly because of the lack of adequate security devices.

Although Europe has not solved all the problems associated with bicycle use in general, the combination of bicycles, public transportation, and autos has been shown to be an effective transportation system. If safe facilities are available for bicycles, people will tend to use them.

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[11] American Embassy, Rome, Airgram to EPA (Dec. 1973).

[12] Steve Hudak and Cary Shaw (Washington Area Bicycle Association, Extensive Study of European Bikeways, June-July 1973).

[13] Nils Rosen, "Modal Split Should Be at Least Triple Split," (presented at Swedish Embassy, June 1973).

[14] Ibid.

B. Japan

In Japan one out of every 3.5 Japanese owns a bicycle. The number of bicycles owned in Japan is estimated at about 33 million. Annual sales of bicycles have averaged 4.9 million in the past 5 years (1968-1972) including export sales. Sixty-nine percent of all Japanese households possessed bicycles in 1971.[15]

As of December 1971, there were 1,420 kilometers of cycling roads in Japan. In 1970, Japan passed legislation (the Law of Improvement of Bicycle Riding Roads for the purpose of enhancing traffic safety and promoting the people's mental and physical health) which resulted in speeding up the construction of cycling roads. Seven long-distance cycling roads have been built in various parts of the country by prefectual and municipal authorities. The Construction Ministry has now started work on the Pacific Cycling Road of 1,560 kilometers from the Kanto area to the Chubu (Central Japan) region along the Pacific Coast, ending at Wakayana City in the Kansai area. Other major cycling roads are now under study. Japan plans to construct a nationwide network of cycling roads with a total length of 25,000 kilometers.[16]

In the first 2 years of a 5-year program (JFY 1971-1975) Japan appropriated 13 billion yen to build a network of bicycle paths. The program is expected to result in a total of 2,900 kilometers of paths, with the participation of 62 cities.[17] Deterrents to bicycle use such as high accident rates and exposure to air pollution from motor vehicles are present in Japan. Some local authorities have taken measures to improve the safety of bicycling, such as establishing exclusive bicycle lanes, permitting cyclists to use sidewalks, and designating certain streets for nonmotorized traffic only.

C. People's Republic of China

To quote from an Airgram of December 1973 to EPA from the U.S. Liaison Office in Peking:

> Bicycles are not merely "an alternative means of transportation" in the Peoples Republic of China; they are an essential conveyance for millions of people. Ownership of private cars is non-existent in the PRC and only a very few people own motor-powered cycles. Thus, to most Chinese, ownership of a bicycle connotes the same image of status and convenience as car ownership does to average Americans. Moreover, bicycles, and three-wheeled cycles, are an important form of goods transportation in the country.
>
> In big cities such as Peking, Shanghai, and a few others, buses, taxis, and military jeeps, as well as cars and small buses belonging to organizations are fairly numerous. In those cities, cyclists are more likely to be in continuous close contact with four-wheeled motor vehicles. In others cities, and in the countryside, motor vehicles, apart from buses, are far fewer.
>
> The risk of accidents is probably no more a disincentive to bicycle ownership in China than it is a disincentive to car ownership in the United States. Public security

[15] American Embassy, Tokyo, Airgram to EPA (Dec. 1973).
[16] Ibid.
[17] Ibid.

measures in China are stringent, and bicycle theft is not a major problem. Almost every bike-owner locks his vehicle when leaving it parked, and police officials seem to consider it a bike-owner's responsibility to do so. This no doubt contributes to a low rate of bicycle theft. Lack of space for parking bicycles or other support facilities is not a problem in China, and certainly presents no disincentive to bicycle ownership. Repair facilities are numerous, and fees minimal, so maintenance also presents no problem for would-be Chinese bike-owners.

With the need to curb energy use and reduce air pollution, the bicycle could be a practicable mode for short trips in the United States. The United States could learn from the successful bicycle transportation systems in other countries.

VIII. STUDY CONCLUSIONS

(1) Bicycle technology, current use, and public opinion survey results indicate that the bicycle is a viable form of adult transportation for short urban shopping, work, and recreation trips.

(2) The bicycle is best suited for short trips. Forty percent of all urban work trips are 4 miles or less, a distance easily traveled by bicycle.

(3) The potential environmental dividend of bicycle transportation in terms of the reduction of energy, air pollution, traffic congestion, and noise, as well as the saving of space warrants further study toward promoting bicycle transport.

(4) As the cost of driving a car or using other modes of transportation increases, the bicycle will continue to become a more desirable mode of travel because of its lower costs.

(5) Realization of a significant shift from autos to bicycles is highly dependent on overcoming four problems:

(a) High bicycle accident rates

(b) High bicycle theft rate

(c) Exposure to automotive pollutants

(d) Lack of adequate financing for support facilities

(6) Cyclist safety is perhaps best improved through the construction of bikeways segregated from automobile traffic, the reduction of automobile travel, better cyclist education, updating and enforcement of traffic laws.

(7) Bicycle theft is perhaps best combatted by better law enforcement methods aimed at making the resale of stolen bicycles a difficult and risky business, by secure parking facilities, and by more effective locking devices.

(8) Reducing the cyclist's exposure to excessive air pollution can only be accomplished through segregated bikeways located a sufficient distance from heavy automobile traffic or on the streets where automobiles are prohibited from traveling.

(9) Financing the construction of adequate support facilities, primarily segregated bikeways and secure parking at public buildings and at mass transit stations will enhance the convenience of cycling and complement all other efforts in removing major obstacles to bicycle usage.

(10) The construction of bikeways and better law enforcement are public goods requiring governmental involvement.

(11) Although the implementation of bicycle programs must occur primarily at the State and local levels, the Federal Government can play a significant advocacy role to promote such programs through Federal aid and publicity.

(12) EPA occupies a broad environmental position vis-a-vis bicycle use.

(13) EPA could contribute to the development of a national bicycle policy in two ways: by encouraging bicycle programs through its rule making related to transportation control plans, by explaining to other Federal agencies the environmental benefits of bicycle use, and by developing environmental assessment impact statement guidelines for bikeway facilities.

IX. GENERAL RECOMMENDATIONS

The objective of this report is to report the state of the art in order to make recommendations to the public. Based on the study findings and conclusions, there is a need for the following actions:

1. *Investigation of the feasibility of making Washington, D.C., a model city for bicycle transportation in time for the Nation's bicentennial*

Washington has considerable potential for developing an integrated bike network with its high-density residential areas close to major employment centers. In conjunction with the national capital transportation controls plans, local jurisdictions and other Federal agencies could try to make D.C. a model city for bicycling.

Determination of the benefits would include defining the

- number of auto trips feasibly converted to bicycle trips before and after Metro completion
- health and recreational benefits
- probable number of accidents eliminated

Determination of costs would include defining the

- assessments of all costs, including environmental impacts
- physical infrastructure costs of the network and facilities
- administrative costs
- police and enforcement costs

2. *Actively promote interagency coordination in the development of a national bicycle policy*

Encouragement of bicycle use nationwide realizes different benefits to each of the Federal agency programs involved. These various aspects should be complementary. Coordination could occur through an existing mechanism, such as the CEQ ad hoc interagency committee on bicycles set up in 1973. Issues appropriate for interagency coordination at this time include:

- analyses of the costs and benefits of bikeway facilities, of the elasticities underlying shifts from auto to bike trips and of methods for alleviating personal safety and bicycle security problems
- sponsorship of a conference on bicycle use in the spring of 1975
- development of environmental impact guidelines for bikeways

3. *Launch a campaign to make the public aware of the benefits of cycling*

The benefits accruing from bicycle use have been inadequately publicized to the public at large. Accordingly a publicity program might include:

- preparing pamphlets, film, and TV commercials on the benefits of bicycle use
- publicizing the Denver Bikeway Network or others

4. *Make it more attractive for Federal employees to commute by bicycle*

The best incentive for the feasibility of change is through example or demonstration. Some of the money from GSA allocated to facilities in Federal agencies could be used for bicycle facilities. If money were available, Federal agencies could install secure bike storage areas and showers for commuting cyclists.

5. *Establish a Federal policy eliminating requirements for motor vehicle parking space in Government-owned buildings and privately leased buildings, then use the savings to construct secure bicycle parking facilities, showers, lockers, etc., in all Federal buildings*

6. *Encourage cycling where it can be an efficient mode and do additional research and study in this rapidly developing field*

7. *Promote special bicycle lanes and safe bicycle parking*

8. *Do additional research and study in the following areas:*

(a) The effect of the air quality on the health of the cyclist
(b) The environmental impact from increased bicycle transportation
(c) Estimate of VMT reduction from bicycle transportation

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Appendix I

ANNUAL SALES OF BICYCLES

Table I

Annual Sales in Millions: U.S. Manufacturers and Imports

Year	Domestic Sales	Import Sales	Total: U.S. & Imp.	Bikes in Use*	Est. Users*
1960	2.6	1.1	3.7	23.5	35.2
1965	4.6	1.0	5.6	32.9	49.3
1968	6.0	1.5	7.5	42.3	63.4
1969	5.1	2.0	7.1	47.7	71.5
1970	5.0	1.9	6.9	50.0	75.3
1971	6.6	2.3	8.9	53.1	79.6
1972	3.5				

* Bikes in use estimate is based estimated bike "life" multiplied by a unit sales factor. Rentals and other multiple use situations are calculated into the Estimated Users estimates.

Source: Bicycle Institute of America, Inc., "Some Facts About the Current Bike Explosion, 1973.

Table II

U. S. Bicycles and Users Per Capita

	1950	1960	1972
U.S. Population	150,000,000	180,000,000	203,000,000
Bicycles	---	23,500,000	50,000,000
Users	19,000,000	35,200,000	75,300,000
Bicycles Per Capita	---	0.13	0.25
Users Per Capita	0.15	0.26	0.37

Source: U.S. Census and Bicycle Institute of America

Table III

Bicycle and Automobile Sales

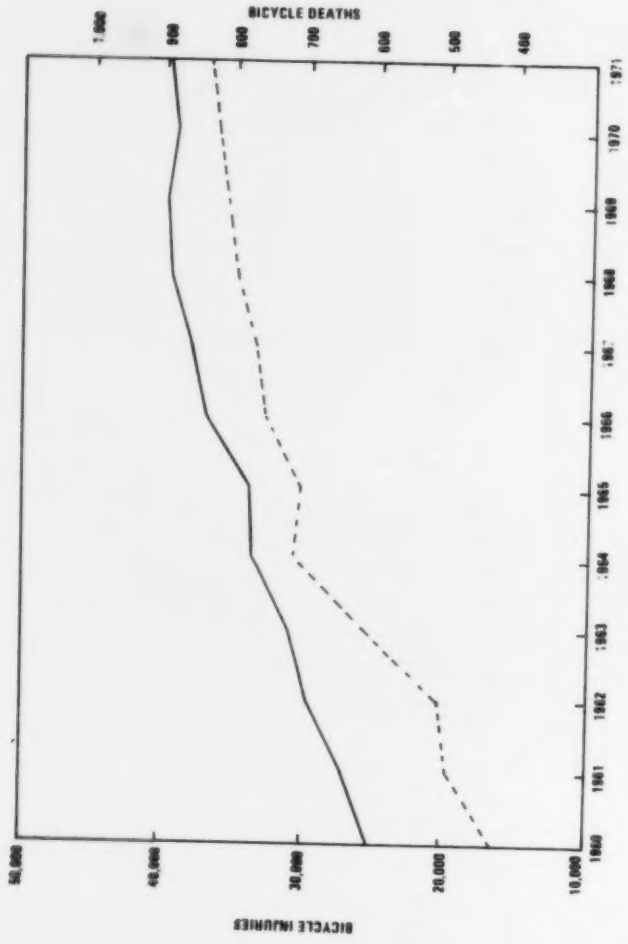
Year	Bicycle Sales (Millions)	Automobile Sales (Millions)
1968	7.5	8.8
1969	7.1	8.2
1970	6.9	6.5
1971	8.9	8.6
1972	13.7	11.0

Source: Some Facts About the Current Bike Explosion, Bicycle Institute of America, 1973.

Appendix II

DATELINE CHART OF BICYCLE INJURIES AND DEATHS

Duplicated from A. Trent Germano, et. al., The Emerging Need of Bicycle Transportation, Georgia Institute of Technology, Jan. 1973.



Appendix III

MULTIPLE USE OF WASTE TREATMENT FACILITIES AND RIGHTS-OF-WAY

Multiple Use of Waste Treatment Facilities and Rights-of-Way

U.S. Environmental Protection Agency — Region I
J. F. Kennedy Federal Bldg. Boston, Mass. 02203

Sewer line construction, Nashua River, Nashua, N.H. — A recreation access opportunity.

Clean Water - Recreation - Open Space

Construction of waste treatment facilities and sewers by cities, towns and sewer districts offers an opportunity to secure open space and recreational access to our waters at the same time. Lands and easements acquired for interceptor sewers, collection systems, and waste treatment plants may also be used for public recreation and ensure the public can enjoy the multimillion investment in clean water achieved.

The 1972 Water Pollution Control Act directs attention to this opportunity:

"The Administrator shall encourage waste treatment management which combines 'open space' and recreational considerations with such management." Section 201(f).

What Are The Benefits?

Sewer easements often parallel our communities, rivers, streams, and attractive water bodies; treatment plants often lie near water. Careful preplanning, design, and acquisition of these easements and lands with recreation uses clearly in mind will give many benefits:

- Provide access for hiking, bicycling, horseback and cross-country ski trails.
- Afford access to water's edge for fishing, boat launching and swimming.
- Create parks and open spaces.
- Protect waterside banks and scenic setting for public enjoyment.
- Link neighborhoods, playgrounds, schools, natural areas, and shopping areas in trail and open space systems.
- Maintain buffer strips to protect water quality.
- Provide a joint utility corridor — for water mains, gas lines, power lines.
- Shape future community growth and open space patterns.

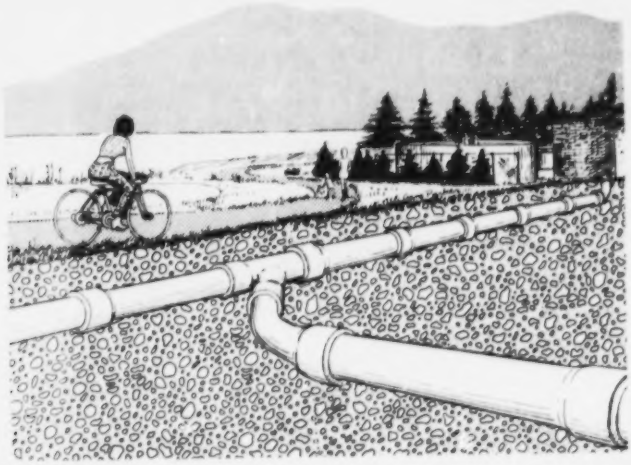
How Can Communities Do This?

Tell your engineering consultant that you wish to build this principle into your clean water construction program. Advise him of the recreation opportunities you have in mind. Your Park Commission, Conservation Commission and others may have ideas.

When easements are taken for sewers, be sure they specify other desired uses, such as hiking trails or canoe launching. In many cases easements for sewers and related recreation can be acquired simultaneously without additional cost. However, if substantial additional lands or costs are incurred, these additional costs may be eligible for Federal or State aid, under parks and recreation programs.

Schedule taking of all easements, zoning, design, and construction as part of the project for efficiency and economy. Bicycle trails, for example, may be built while regrading interceptor rights-of-way.

Lewiston, Maine, for example, is planning an urban bicycle and foot path along a new sewer line beside the Androscoggin River, connecting three riverside parks and linking the downtown district with outlying residential areas.



Who Can Help?

Call upon local, regional, and state park, recreation, and planning agencies; utility districts; and public utilities.

For park land and open space acquisition and development related to treatment facilities, EPA encourages funding under the Land and Water Conservation Fund administered by the U.S. Bureau of Outdoor Recreation (BOR). BOR provides 50 percent Federal grants for acquisition and development of recreation lands. Projects in accord with the State comprehensive outdoor recreation plan and meeting high priority public recreation needs identified in the plan are eligible for funding, including bicycle paths and hiking trails. Submit project proposals to the appropriate Bureau of Outdoor Recreation Regional Office through the State agency contact for the Land and Water Conservation Fund Act.

Local conservation commissions and land trusts, such as The Nature Conservancy, may also be helpful.

State and Regional Contacts

Connecticut
Douglas M. Costle, Commissioner
Department of Environmental Protection
Hartford, Connecticut 06115
203 566-2110

Maine
Lawrence Stuart, Commissioner
Division of Parks and Recreation
Augusta, Maine 04330
207 289-3821

Massachusetts
Arthur W. Brownell, Commissioner
Department of Natural Resources
Boston, Massachusetts 02114
617 727-3163

New Hampshire
George Gilman
Department of Resources & Economic Development
Concord, New Hampshire 03301
603 271-2411

Rhode Island
Dennis J. Murphy, Jr., Director
Department of Natural Resources
Veterans Memorial Building
Providence, Rhode Island 02903
401 277-2771

Vermont
Forrest E. Orr, Director of Planning
Agency of Environmental Conservation
Montpelier, Vermont 05602
802 828-3357

U.S. Environmental Protection Agency
Bart Hague
John F. Kennedy Federal Building
Room 2203
Boston, Massachusetts 02203
617 223-5131

U.S. Bureau of Outdoor Recreation
Robert F. Gift
Federal Office Building
600 Arch Street
Philadelphia, Pennsylvania 19106
215 597-7387

Appendix IV

FEDERAL-AID HIGHWAY PROGRAM MANUAL

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
WASHINGTON, D.C. 20590

FEDERAL AID HIGHWAY PROGRAM MANUAL

TRANSMITTAL 18
March 8, 1974
HNG-22

1. MATERIAL TRANSMITTED

Subsection 1, Bikeways and Pedestrian Walkways in Conjunction with Federal and Federal-aid Highways; Section 1, General; Chapter 1, Engineering; Volume 6, Engineering and Traffic Operations.

2. EXISTING ISSUANCES AFFECTED

Supersedes PPM 21-23 dated March 14, 1973.

3. COMMENTS

This issuance contains instructions for the immediate implementation of 23 U.S.C. 217. This section of the Act has been interpreted briefly as follows:

a. Bicycle facilities and walkways, as incidental features of highway construction projects, may continue to be approved without restrictions as to the amount or sources of funds, provided the bikeway or walkway is within the highway right-of-way and is constructed concurrently with a Federal-aid highway project.

b. Federal-aid funds, except Interstate, may be used for the construction of bicycle and pedestrian facilities independent of highway projects, for facilities off the normal Federal-aid highway right-of-way, and for additional right-of-way for construction of these facilities. The amount of Federal-aid participation in these types of projects is subject to the funding limitations set forth in the Act, namely, not more than $40 million in any fiscal year and not more than $2 million by any State in any fiscal year.

c. The Division Engineer in each State should insure that the State is aware of the availability of

Federal-aid highway funds for the construction of bicycle and pedestrian facilities and should encourage the maximum utilization of these funds for this purpose.

4. REGULATORY MATERIAL

The regulatory material reflected in the attached directive appears in italicized type and will be published as regulations in the Federal Register.

5. FILING INSTRUCTIONS

The material transmitted by this issuance is to be filed as indicated below:

a. Page Changes

Remove	Insert
1 of Table of Contents for Vol. 6, Chap. 1, dated 12/17/73	i of Table of Contents for Vol. 6, Chap. 1, dated 3/8/74
PPM 21-23, dated 3/14/73 (Vol. 6, Chap. 1, Sec. 1, Subsec. 1)	1 thru 10, Vol. 6, Chap. 1, Sec. 1, Subsec. 1, dated 3/8/74

b. Transmittal Changes. After filing the attached pages, this transmittal should be filed behind the tab identified as "Transmittal Changes" in Book V.

Norbert T. Tiemann
Federal Highway Administrator

DISTRIBUTION
Basic

CHAPTER 1. ENGINEERING

SECTION 1. GENERAL

SUBSECTION 1.	BIKEWAYS AND PEDESTRIAN WALKWAYS IN CONJUNCTION WITH FEDERAL AND FEDERAL-AID HIGHWAYS	
SUBSECTION 2.	HIGHWAY IMPROVEMENTS IN THE VICINITY OF AIRPORTS	PPM 20-13
SUBSECTION 3.	URBAN HIGHWAY PUBLIC TRANSPORTATION	PPM 50-10 IM 21-13-67(1)
SUBSECTION 4.	COORDINATION OF, AND FEDERAL-AID PARTICIPATION IN ROAD RELOCATIONS MADE NECESSARY BY THE CONSTRUCTION OF WATER RESOURCES DEVELOPMENT PROJECTS	PPM 50-4.2
SUBSECTION 5.	INTERSTATE SYSTEM STATUS REPORT	PPM 10-6 IM 10-1-73
SUBSECTION 6.	JURISDICTION OF TOLL ROAD AUTHORITIES TO MAKE MODIFICATIONS IN TOLL ROADS DESIGNATED AS PART OF THE INTERSTATE SYSTEM	IM 20-5-67
SUBSECTION 7.	1975 INTERSTATE COST ESTIMATE	NOTICE 10-18-73

SECTION 2. PRELIMINARY ENGINEERING

SUBSECTION 1.	PRELIMINARY ENGINEERING	PPM 21-3 IM 21-7-72
SUBSECTION 2.	ENGAGEMENT OF CONSULTANTS FOR ENGINEERING SERVICES	PPM 40-6

CHAPTER 1. ENGINEERING (continued)

SUBSECTION 3. FEDERAL-AID MATCHING RATIO IM 20-3-68

SUBSECTION 4. CONTROL SURVEYS CM-12-12-57

SUBSECTION 5. AERIAL SURVEYING CM 3-16-59
CM 1-6-67

SECTION 3. CONSTRUCTION ENGINEERING

SUBSECTION 1. PRESERVATION OF ESSENTIAL ENGINEERING DATA BY AVOIDING DESTRUCTION OF PERMANENT SURVEY MONUMENTS IM 20-1-60

SUBSECTION 2. RAILWAY-HIGHWAY INSURANCE PROTECTION REQUIRED OF CONTRACTORS PPM 20-12

Par.

1. PURPOSE
2. AUTHORITY
3. DEFINITION
4. BACKGROUND
5. POLICY
6. FEDERAL PARTICIPATION
7. PLANNING
8. APPLICABILITY OF EXISTING LAW, REGULATION AND DIRECTIVES
9. DESIGN CRITERIA FOR BIKEWAYS AND WALKWAYS
10. SHARED ROADWAYS
11. PROGRAMMING

1. PURPOSE

* *The purpose of this subsection is to provide policies and procedures relating to bicycle and pedestrian facilities on Federal-aid system highways and Federal participation in the cost of these facilities.*

2. AUTHORITY

23 U.S.C. 217, 315, 109

3. DEFINITIONS

a. "Bicycle" means a two-wheeled vehicle propelled solely by human power.

b. "Bikeway" means a continuous way designated for use of bicycles and other vehicles propelled by human power.

* Regulatory material is italicized

c. *"Bicycle trail" means a bikeway separated from the through lanes for motor vehicles by space or barrier.*

d. *"shared roadway" means a roadway which may be shared by motor vehicles and bicycles, or a portion of which is reserved for use by bicycles and other nonmotorized vehicles.*

e. *"Pedestrian walkway" or "walkway" means a continuous way designated for pedestrians and separated from the through lanes for motor vehicles by space or barrier.*

f. *"Highway construction project" means a project financed in whole or in part with Federal-aid or Federal funds for the construction, reconstruction or improvement of a highway or a portion thereof, including bridges and tunnels.*

g. *"Independent bikeway or walkway construction project" means a highway construction project to provide bicycle or pedestrian facilities, in contrast with a project whose primary purpose is to serve motorized vehicles.*

h. *"Snowmobile" means a motorized vehicle solely designed to operate on snow or ice.*

4. BACKGROUND

a. There is a growing interest in bicycling and walking for commuting, for recreation, and for other trip purposes. Where this activity occurs on high speed roadways, both safety and efficiency are impaired because of the mixture of motorized and nonmotorized modes of travel. Provision of bikeways or pedestrian walkways will promote safety and will assist in retaining the motor vehicle carrying capacity of the highway while adding new bicycle capacity. The Congress has recognized the importance of bicycle and pedestrian travel and has included special provisions for these modes in the Federal-Aid Highway Act of 1973. Section 124 of this Act amends Title 23, U.S. Code, by adding section 217 thereto, the principal provisions of which are:

(1) Federal funds available for the construction of preferential facilities to serve pedestrians and persons on bicycles are those apportioned in accordance with paragraphs (1), (2), (3), and (6) of section 104(b), 23 U.S.C. and those authorized for forest highways, forest development roads and trails, public land development roads and trails, park roads and trails, parkways, Indian reservation roads and public land highways.

(2) Not more than $40 million of funds appropriated in any fiscal year for purposes described in the preceding paragraph may be obligated for bicycle projects and pedestrian walkways.

(3) No State shall obligate more than $2 million of Federal-aid funds for such projects in any fiscal year.

(4) Such projects shall be located and designed pursuant to an overall plan which will provide due consideration for safety and contiguous routes.

(5) No motorized vehicles shall be permitted on such trails or walkways except those for maintenance purposes and, where snow conditions and State or local regulations permit, snowmobiles.

b. Nothing in the Federal-Aid Highway Act of 1973 is construed as having the intent of curtailing or precluding the provision of bicycle or pedestrian facilities as incidental items of construction in conjunction with highway improvements for the primary purpose of serving motor vehicular traffic. Accordingly, such bicycle or pedestrian facilities are not subject to the funding limitations contained in section 124 of the Act. Such funding limitations are held to be applicable to independent bikeway or walkway construction projects.

5. POLICY

a. The provision of bicycle and pedestrian facilities on Federal-aid highway projects is encouraged. The construction of bicycle facilities and walkways may be

approved as either incidental features of highway construction projects primarily for motor vehicular traffic or as independent bikeway or walkway construction projects where all of the following conditions are satisfied:

(1) The facility will not impair the safety of the motorist, bicyclist or pedestrian.

(2) The facility will be accessible to users or will form a segment located and designed pursuant to an overall plan.

(3) A public agency has formally agreed to:

(a) operate and maintain the facility.

(b) ban all motorized vehicles other than maintenance vehicles and, when snow conditions and State or local regulations permit, snowmobiles.

(4) It is reasonably expected that the facility will have sufficient use in relation to cost to justify its construction and maintenance.

6. FEDERAL PARTICIPATION

a. Bicycle and pedestrian facilities may be constructed as incidental features of highway construction projects where the bikeway or walkway is to be constructed concurrently with the improvement for motor vehicular traffic and the bikeway or walkway will be within the normal right-of-way of the highway, including land acquired under 23 U.S.C. 138 and 319 (Traffic Improvements and Scenic Enhancement Programs). Projects constructed as incidental features of larger highway construction projects may be financed with the same types of Federal-aid funds as the basic highway project, including Interstate projects, and are not subject to the funding limitations for independent bikeway or walkway projects.

b. Independent bikeway or walkway construction projects may be financed with all types of Federal-aid funds except Interstate, provided the total amount obligated

for all such projects in any one State in any one fiscal year does not exceed $2 million of Federal-aid funds or a lesser amount apportioned by the Federal Highway Administrator to avoid exceeding the annual $40 million cost limitation on these projects for all States in a fiscal year. Independent bikeway or walkway projects may be constructed on completed sections of Federal-aid highways. Projects may include the acquisition of land outside the right-of-way, provided the facility will accommodate traffic which would have normally used a Federal-aid highway route, disregarding any legal prohibitions on the use of the route by cyclists or pedestrians.

c. *The Federal share payable for bicycle or pedestrian facilities on a Federal-aid system shall be as provided in 23 U.S.C. 120 for such systems, except that independent bikeway or walkway construction projects on the Interstate System shall be financed as projects on the primary system or urban extensions thereof.*

d. *Federal participation in eligible bicycle and pedestrian facilities may include:*

(1) *The costs of grading, drainage, paving, barriers, landscaping, and structures necessary to accommodate the number and type of users of the facility.*

(2) *The costs of supplementary facilities such as shelters, parking facilities, bicycle storage facilities and comfort stations.*

(3) *The costs of traffic control devices including signs, signals and pavement markings.*

(4) *The costs of fixed source lighting where its use is appropriate.*

(5) *The costs of curb-cut ramps on new and existing facilities, including those for the physically handicapped.*

(6) *The costs of right-of-way (land acquisition and relocation assistance) on independent bikeway and walkway construction projects.*

(7) *The costs of walks, barriers and additional widths and lengths on bridges necessary for bikeways and pedestrian walkways for route continuity.* Washington headquarters approval is required where it is proposed to route a bikeway over a sizable structure such as a major stream crossing or viaduct.

(8) *The costs of bikeway and walkway grade separations where:*

(a) *Vehicular speeds and crossing volumes constitute a hazard of such magnitude as to justify the cost of the structure and the bikeway or walkway cannot be rerouted to another structure; or*

(b) *The separation is necessary because the highway has complete control of access.*

7. PLANNING

Bikeways should be planned as parts of bicycle transportation systems. Where planning is conducted under 23 U.S.C. 134(a), consideration should be given to including bicycle transportation. Funds provided by 23 U.S.C. 307(c) may be used to plan bikeways. Consultation with organized groups of bicyclists is certain to prove valuable in the planning and design of bikeway projects, and such counsel should be actively sought.

8. APPLICABILITY OF EXISTING LAW, REGULATION AND DIRECTIVES

The provisions of 23 U.S.C. apply. Normal Federal-aid procedures established by existing directives are to be followed. This shall include, but not be limited to, applicable sections pertaining to the following: equal employment opportunity, labor provisions, maintenance requirements and utility adjustment. The A-95 Clearinghouse Requirement and the 3-C Planning Requirement may be waived where a determination is made that a bikeway or walkway will have no significant effect on land use or public works activities.

9. DESIGN CRITERIA FOR BIKEWAYS AND WALKWAYS

a. Bikeways and walkways should be designed and constructed in a manner suitable to the site conditions and the

anticipated extent of usage. The Division Engineer may determine the acceptability of proposed standards or design criteria for trail and walkway construction. In general, a bikeway should be designed with an alignment and profile suitable for bicycle use, with a surface that will be reasonably durable, that incorporates drainage as necessary, and that is of a width appropriate for the planned one-way or two-way use. Where the bikeway or walkway crosses a street or highway at grade, the location should be such as to insure adequate sight distance, and the design should include traffic control devices for the motor vehicle, the bicycle and the pedestrian, as necessary for safe operation.

b. Bicycle trails, as distinguished from bicycle lanes and shared roadways, should be separated from the roadway a safe distance. Where acceptable separation of the trail from the roadway cannot be otherwise attained, a barrier such as a hedge, fence or guardrail should be erected. Where a bicycle trail along a highway crosses a natural barrier or a transportation route for which a grade separation is necessary, practical alternate structure treatments should be considered. It may be in order to align the trail so as to utilize a highway structure (widened as needed) and with a barrier separation rather than provide a more expensive separate trail overpass or underpass structure.

10. SHARED ROADWAYS

a. Shared roadway arrangements that result in bicycles operating within the same lanes as high speed traffic should be avoided. In some cases, bicycle lanes outside the through lanes, either on the shoulder or parking lane where parking has been removed, can satisfactorily accommodate bicycle traffic. Within cities, low-volume thoroughfares may provide reasonably safe bicycle operating conditions.

b. In sparsely developed areas where local ordinances permit and pedestrian volumes are not high, utilization of existing sidewalk systems with appropriate intersection treatments may be suitable segments for bikeways.

11. PROGRAMMING

a. Approval Procedures

(1) Division Engineers may approve requests to obligate funds made available under section 217 of Title 23, U.S.C. (section 124 of the 1973 Act) for construction of independent bikeway or walkway projects to the extent that the limits specified on the obligation of such funds are not exceeded. The Division Engineer's approval of PS&E and authorization to advertise (stage 2, step 4) shall establish the obligation of Federal funds with regard to a particular project. For FY 1974, it will be his responsibility to insure that the total amount of Federal-aid funds obligated does not exceed $2 million. This limitation does not apply to projects by other Federal agencies for independent bikeway and walkway projects to be constructed with funds authorized for forest highway, forest development roads and trails, public land development roads and trails, park roads and trails, parkways, Indian reservation roads and public lands highways. It will also be the Division Engineer's responsibility to determine from the Washington Office Program Analysis Division that the amount to be obligated will not cause the total of Federal and Federal-aid funds obligated for all such projects in any fiscal year to exceed $40 million. If the amount to be obligated will not cause either limit to be exceeded, normal Federal-aid program procedures will be followed in the execution of the project.

(2) In order that there will be maximum utilization of funds authorized to be obligated for independent bikeway or walkway projects, stage 2 projects should be only for those items of preliminary engineering, right-of-way, or construction for which work is scheduled to proceed promptly. If unforeseen developments occur which indicate that a stage 2 project, after authorization, cannot be advanced within a reasonable period and if no costs have been incurred, it should be reverted to programmed only status in order that funds available for obligation may be used on other independent bikeway

projects. The Division Engineer should notify the Washington office immediately that the obligation authority for independent bikeway funding may be reassigned.

(3) *Obligation of FY 1974 fiscal year funds may commence immediately on a first come, first served basis subject to the funding limitations set forth in section 6b.*

(4) *For FY 1975 and 1976, each State shall submit a program covering all independent bikeway or walkway construction projects not later than May 1, 1974, in the case of FY 1975 funds, and May 1, 1975, in the case of FY 1976 funds, identifying proposed projects and the source or sources of funds from which such projects are to be financed. Its proposed obligations shall not exceed $2 million in Federal-aid funds for each fiscal year. In the event the aggregate sum of all Federal and Federal-aid funds proposed to be obligated by all States and Federal agencies exceeds $40 million for either fiscal year 1975 or 1976, funds for obligation will be allocated to the States by the Federal Highway Administration in relation to the apportionment received by the applicant States under 23 U.S.C. 104(b)(1), (2), (3), and (6).* Each State will be advised of any allocation not later than June 1, 1974, for FY 1975, and June 1, 1975, for FY 1976. The Division Engineer will insure that the allocation for each fiscal year will not be exceeded.

b. Project Identification

(1) All independent bikeway and walkway construction projects shall be identified by the prefix letters BW followed by the Federal-aid primary, secondary, urban or other project number (BWRF, BWRS, BWU, etc.) for that section of highway route. The agreement number in parentheses shall be the next available consecutive number in the series for that project number.

(2) Type code Y052 shall be reported for all line items on forms PR-37 submitted for independent bikeway or walkway projects. Bicycle and walkway facilities constructed as incidental parts of highway construction projects shall not be so identified.

(3) Costs for bicycle, pedestrian and equestrian facilities constructed as incidental features of highway projects should be shown on a separate line on form PR-37 and identified by type code Y009 "pedestrian overpasses or underpasses," or Y051 "paths (including sidewalks)." Code Y009 should include all structures not carrying motor vehicles whether for bicycle or pedestrian use, or whether over a highway, railroad or waterway. Costs of sidewalks on structures, pavement markings, signs and signals incidental to construction for motor vehicles should not be separately reported under codes Y009 or Y051.

Appendix V

POTENTIAL FEDERAL PROGRAMS FOR BICYCLE TRANSPORTATION

--Land and Water Conservation Fund (Interior Department)
--Federal-Aid Highway Programs (Department of Transportation)
--Title VII "Open Space Land Grants (Housing and Urban Development)
--Urban Beautification and Improvement Grants (Housing and Urban Development
--Urban Renewal (Housing and Urban Development)
--Recreation and Public Purposes Act (Bureau of Land Management, Interior Department)
--Public Law 566: Small Watershed Act (U.S. Soil Conservation Service Agriculture)
--"701" Planning Grant Program (Housing and Urban Development)
--State and Community Highway Safety Program (Department of Transportation)
--Public Works and Economic Development Programs (Economic Development Administration, Commerce)
--Historic Preservation (Housing and Urban Development, Interior)
--Older Americans Act (Administration on Aging, Health, Education and Welfare)
--Public Facilities Land Advanced Grants (Housing and Urban Development)

Appendix VI

SUMMARY OF 1973 STATE BIKEWAY LEGISLATION

Summary of 1973 Bikeways Legislation
Will Cyclists in Your State Benefit?

The following is a state-by-state compilation of bikeway legislation as introduced so far this year. Most of it calls for the construction of new bicycling facilities, some with feasibility studies, with acquisition and development of land, and a lot of it with methods of funding. All of it, when enacted, will benefit cyclists enormously, providing them with paths, trails, parking, recreation, or commuter cycling facilities.

Whether or not these bills ever become law is largely up to you. They need your support. Write to the legislators listed here who have introduced bikeway bills in your state. Volunteer your help. Ask them how you can best support this legislation. Find out the dates of hearings, and plan to appear and testify. Rally the support of friends, neighbors, bike club members and family. If your state is not represented here, write away for a copy of one of the bills that interests you, then convince a favorite legislator to introduce a similar one for cyclists in your state. Passage of these bills will make cycling safer and more pleasant for all; their passage is vital to the continued growth of cycling . . . and your help is needed. Do it now!

LEGEND:

H.B. House Bill — *S.B. Senate Bill* — *A.B. Assembly Bill*
J.R. Joint Resolution — *C.R. Concurrent Resolution*
3/7/73 Date Introduced — *John Jones (R-Dist #2) Name, party and district of sponsors*

ARIZONA

H.B. 2282, 2/13/73, Michael Goodwin (R-Dist. #27)
John Wettlaw (R-Dist. #2), Charles W. King (R-Dist. #14)
Provides that the state highway director design and construct a system of bicycle pathways and foot pathways adjacent to certain state highways in cooperation with the Federal aid highway program.

H.R. 2162, 2/5/73, Helen Grace Carlson (D-Dist. #13)
John Wettaw (R-Dist. #2), Benjamin Hanley (D-Dist. #2)
Provides that the state shall establish and maintain bicycle trails and footpaths provided they are not contrary to public safety; bill also provides for bike registration and devices to assure safe operation.

H.C.R. 2016, 2/13/73, Michael Goodwin (R-Dist. #27)
Sandra D. O'Connor (R-Dist. #24)
Proposed amendment to Arizona constitution designates specific uses of vehicles and other tax receipts for many street and highway purposes, including construction and maintenance of bicycle pathways.

CONNECTICUT

S.J.R. 14, 1/10/73, Peter L. Cashman (R-Dist. #20)
Resolution requires the Committee on Transportation to study the best means of using available Federal funds for creating bicycle trails, and making its recommendations to the 1974 session of the General Assembly.

S. 974, 1/22/73, Lawrence J. Denardis (R-Dist. #34)
Proposes adoption of a State Bike Act by the Senate and House to encourage the use of bicycles by allocating a portion of the revenues from gasoline taxes to finance bikeways and bike paths.

S. 115, 1/10/73, Peter L. Cashman (R-Dist. #20)
Provides for enactment of a law establishing bicycle lanes on state highways together with appropriate road signs to provide for the safety of bicyclists and motorists.

S. 1155, 1/22/73, Ruth O. Truex (R-Dist. #9)
Provides for the Department of Transportation to study the feasibility of a program of bicycle use and travel as an alternate means of transportation for commuters, giving consideration to creating bike lanes along highways.

H.B. 7537, 1/23/73, John N. Demerell (R-Dist. #35)
William L. Churchill (R-Dist. #100)
Provides for creating a bike path on the unused roadbed of the old New York, New Haven and Hartford Railroad, with small picnic areas at selected sites along the route made available to bike riders.

H.B. 7095, 1/23/73, David O. Odegard (R.-Dist. #4)
Donald S. Genovesi (R-Dist. #12)
Francis J. Mahoney (D-Dist. #18)
Provides for the passage of a law requiring bicycle paths along all new highways constructed by the state in the future.

H.B. 6986, 1/22/73, Virginia S. Connolly (R-Dist. #18)
Russell L. Post, Jr. (R-Dist. #62)
Provides that the Commissioner of Transportation may pay one-half of the cost of construction of bicycle paths on private property to encourage their availability and use by the public.

H.B. 6549, 1/18/73, Richard L. Mercier (D-Dist. #44)
Provides for the establishment and maintenance of bike trails in the state forests at no expense to the state, and with the approval of the Commissioner of Environmental Protection.

Support Bikeways

CONNECTICUT (Cont.)

H.B. 5267, 1/9/73, Morton J. Blumenthal (R-Dist. #50)
Provides for adoption of a master plan to encourage the promotion, development and maintenance of existing and proposed bicycle trails, horse trails and hiking trails for the maximum benefit of the citizens of the state.

H.B. 5269, 1/9/73, Joseph S. Coatsworth (D-Dist. #32) John A. Fabrizio (R-Dist. #140)
Provides for the Commissioner of Environmental Protection to establish linear parks for bicycle use throughout the state, thus creating areas for the exclusive use of bike riders and better use of natural resources.

FLORIDA

H.B. 1, 4/3/73, Murray H. Dubbin (D-Dist. #115)
Allocates a portion of the state's first gas tax beginning in fiscal 1974-75 and annually thereafter for the construction and maintenance of bicycle trails and footpaths, and a uniform system of signs and regulations.

H.B. 100, 4/3/73, Arthur H. Rude (R-Dist. #85)
Provides for establishing the Florida recreational trails system – a state-wide network of recreation trails to be used for bicycling, hiking, horseback riding and driving in motor vehicles where feasible.

H.B. 103, 4/3/73, John J. Savage (R-Dist. #57)
Provides for the establishment and maintenance of bicycle trails throughout the state, and authorizes the Dept. of Transportation to defray cost from the state roads trust fund.

S. 246, 4/3/73, Ralph R. Poston, Sr. (D-Dist. #38)
Companion bill to H.B. #1 (see above) – allocates a portion of state's first gas tax for the construction and maintenance of bicycle trails and footpaths, and a uniform system of signs and regulations.

GEORGIA

H.B. 870, 2/22/73, W. W. Larsen, Jr. (D-Dist. #102)
Authorizes and directs the Georgia Department of Transportation to construct bicycle trails in the state, after the routes of such trails have been determined by the Department of Natural Resources.

HAWAII

H.B. 174, 1/22/73, Tadao Beppu (D-Dist. #10)
Requires that bicyclists ride single file upon a roadway, except on paths or parts of roadways set aside for the exclusive use of bicycles where riding not more than two abreast may be permitted.

H.B. 237, 1/22/73, John S. Carroll (R-Dist. #2)
Proposes appropriation of funds from general revenues to provide for planning and constructing bikeways and bike paths in the 12th Representative District.

H.B. 251, 1/22/73, John S. Carroll (R-Dist #2)
Amends existing statutes to provide that not less than one percent of all taxes expended by the Highway Fund be used for the design and construction of bikeways in the county where collected.

H.B. 484, 1/26/73, Charles T. Ushijima (D-Dist. #13)
Amends existing statutes to provide that a portion of State Highway Fund be expended for the construction of bikeways when feasible wherever a highway, road or street is being built or rebuilt.

H.B. 491, 1/26/73, Richard Garcia (D-Dist. #17)
Amends existing statutes to provide for the establishment and maintenance of bicycle trails and footpaths from the State Highway Fund wherever a highway, road or street is being built or rebuilt.

H.B. 515, 1/29/73, Jean S. King (D-Dist. #14)
Provides state funds for the construction of bikeways and bicycle facilities in the Waikiki, Oahu, area to bring recreational pleasure to the people and alleviate some of the traffic congestion.

H.B. 582, 2/1/73, Akira Sakima (D-Dist. #18)
Anson Chong (D-Dist. #13)
Establishes means for financing the design and construction of bikeways by specifying that all taxes collected as a result of increases in rates of state taxes be applied to the needs of bikeways.

H.B. 749, Companion bill to H.B. 484 (see above)

S.R. 126, 3/2/73, Percy Mirikitani (D-Dist. #6)
Resolution requests Department of Transportation to expend previously appropriated funds to building a bikeway along the Ala Wai Canal to provide greater riding safety and scenic and recreational attractions.

ILLINOIS

S. 93, 1/24/73, Sam M. Vadalabene (D-Dist. #56)
Requires the Highway Department to expend one percent of available motor fuel tax allotments for the establishment, designation and maintenance of bicycle paths and footpaths in conjunction with highways, roads and streets.

INDIANA

H. 1757, 2/8/73, Floyd B. Coleman (R-Dist. #13)
Provides for the appropriation of one percent of the State Motor Vehicle Highway Account for the planning, development, construction and maintenance of bicycle trails.

H. 1896, 2/9/73, Nelson D. Kennedy (D-Dist. #69)
Authorizes the State Highway Commission to establish bike paths and routes for the purpose of safely accommodating bicycles and their riders, and provides for a study to determine the best locations and routes for such paths.

Support Bikeway Legislation

MASSACHUSETTS

S. 25, 1/3/73, John F. Aylmer (R)
Provides for the Commonwealth to reimburse cities and towns in planning, designing and constructing bicycle paths and hiking trails from funds previously appropriated.

S. 881, 1/3/73, William L. Saltonstall (R)
Provides additional regulations for the operation of bicycles to assure greater safety for the bike rider and consistent with the traffic regulations governing motor vehicles.

S. 1331, 1/3/73, John F. Aylmer (R)
Provides for the construction of bicycle paths with Chapter 90 funds; such paths may be established wherever a road is being constructed, reconstructed or relocated.

S. 1374, 1/3/73, Thomas F. Brownell (D)
Arthur H. Tobin (D)
Provides for the establishment of bicycle trails and footpaths wherever a highway, road or street is being built, rebuilt or relocated out of the State Highway Fund.

H.B. 1444, 1/3/73, Terrence P. McCarthy (I)
Proposes an amendment to the State Constitution which provides revenues from the Highway Fund for highway-related bicycle paths.

H.B. 1648, 1/3/73, Terrence P. McCarthy
Provides for an amendment to existing law relative to the state's accelerated highway program for highway-related bicycle paths.

H.B. 3095, 1/3/73, John S. Ames (R)
Provides for setting up a joint board of three state departments to develop a master plan and a method of financing of a system of highway-related trails, including bicycle paths and hiking trails.

H.B. 3912, 1/3/73, Alan D. Sisitsky (D)
Robert J. McGinn (D), Garreth J. Lynch (D)
Authorizes and directs the County Commissioners of several counties to construct bicycle paths at suitable locations in order to provide recreational facilities and help relieve traffic congestion.

MICHIGAN

S. 198, 2/27/73, David A. Plawecki (D-Dist. #12)
Directs the State Highway Department to construct a system of intra-city bicycle paths between Detroit and Sault Sainte Marie, paralleling state or federal highways, and to assure their maintenance and repair.

MISSOURI

H.B. 743, 2/21/73, Eric F. Fink (R-Dist. #92)
Earl L. Sponsler (D-Dist. #151)
Provides that the State Highway Dept. may participate with the Federal government in the development, design, construction and maintenance of bicycle paths or lane, shelters and parking facilities.

MONTANA

H.B. 371, 1/26/73, Gary Kimble (D-Dist. #18)
Barbara K. Bennetts (D-Dist. #12)
Robert W. Watt (D-Dist. #18)
Provides for the Highway Commission to earmark its own funds to establish a uniform system of bicycle trails and footpaths along highways, roads and streets in parks and recreation areas.

NEBRASKA

H.B. L156, 1/16/73, Orval A. Keyes (Dist. #3)
Authorizes use of Highway Allocation Fund by cities and counties for the establishment of bicycle trails and footpaths wherever a highway, road, or street is being built, rebuilt or relocated.

NEVADA

S.B. 327, 2/27/73, John P. Foley (D)
Authorizes an appropriation of $250,000 to the Department of Conservation and Natural Resources to match available Federal funds for the purpose of constructing bicycle paths.

NEW HAMPSHIRE

H.B. 420, 2/20/73, Elizabeth A. Greene (R-Dist. #17)
Provides for the establishment of a system of bicycle trails which are to be constructed within the rights of way existing or new highways and in state parks and recreation areas.

H.B. 298, 2/1/73, Robert H. Gillmore (R-Dist #34)
Amends existing law to permit the Director of Community Recreation to designate certain highways as bicycle trails, and to publish maps and literature describing same.

H.B. 34, 1/3/73 Malcolm J. Stevenson (R-Dist. #3)
Amends existing law relative to the rules of the road and licensing of bicycles using public highways, special bicycle paths or trails.

NEW JERSEY

S.R. 16, 3/27/72, Frank X. McDermott (R-Dist. #9)
Jerome M. Epstein (R-Dist. #9)
Resolution requests the Department of Transportation to study the feasibility of establishing separate bicycle trails and passageways along state highways and parkways, and report findings to Governor and Legislature.

NEW MEXICO

H.B. 85, 1/19/73, Raymond Garcia (D-Dist. #12)
John J. Mershon (D-Dist. #51)
Provides for the establishment of bicycle lanes, footpaths and bridle paths on certain state, county and municipal roads, and authorizes highway funds to defray costs of construction and maintenance.

H.B. 118, 1/24/73, Fred A. Gross, Jr. (R-Dist. #21)
Bill L. Lee (D-Dist. #42)
Senate Companion Bill to H-85 (see above) which authorizes establishment of bicycle lanes, footpaths and bridle paths, and the expenditure of highway funds for their construction and maintenance.

NEW YORK

H.B. A-598. 1/3/73. G. Oliver Koppell (D-Dist. #84)
Amends highway law to provide for the construction and maintenance of bicycle trails and footpaths wherever a highway, road or street is being constructed, reconstructed or relocated with the use of state funds.

H.B. A-223. 1/3/73. Clarence D. Lane (R-Dist. #102)
Requires the Commissioner of Parks and Recreation to promulgate a comprehensive plan for the establishment of a state-wide trails system which would include bikeways and footpaths, among others.

H.B. A-224. 1/3/73. Clarence D. Lane (R-Dist. #102)
Establishes a Council on Trails and Bikeways with broad powers for formulating a plan for establishing a statewide trails system, and promulgating regulations for its administration and use.

S.B. 1037. 1/10/73. Bernard C. Smith (R-Dist. #2)
Senate Companion Bill to H.B. A-223 (see above) requiring the Commisioner of Parks & Recreation to promulgate a comprehensive plan for a statewide system which would include bikeways, footpaths, etc.

S.B. 1041. 1/10/73. Bernard C. Smith (R-Dist. #2)
Senate Company Bill to H.B. A-224 which establishes a Council on trails and Bikeways with broad powers to formulate a plan for establishing a state-wide trails system and regulations for its administration.

NORTH CAROLINA

H.B. 460. 2/23/73. Ernest B. Messer (D-Dist. #44)
Liston B. Ramsey (D-Dist. #44), Wade Smith (D-Dist. #15)
Creates a North Carolina Appalachian Trail System to provide for the designation, acquisition and administration of recreation, scenic and connecting or side trails and trail rights-of-way.

OKLAHOMA

H.B. 1368. 2/26/73. Jack L. Lindstrom (D-Dist. #64)
Creates the Oklahoma Trails System Act which would establish a system of scenic and recreation trails, and campsites for bicyclists, hikers and horseback riders, and authorizes necessary state funds.

LOTS OF BIKEWAYS

There are more than 25,000 miles of marked bike routes in America in nearly 300 towns and cities, with more than 265 communities planning them right no-

PENNSYLVANIA

H.B. 189. 1/29/73. George W. Gekas (R-Dist #103)
W. William Wilt (R-Dist. #180), Charles H. Dager (R-Dist. #151)
Establishes a state-wide scenic and recreation trails system for the benefit of hikers, horseback riders and bicyclists, and authorizes funds for acquisition of connecting or side trails and trail rights-of-way.

RHODE ISLAND

H.B. 5197. 1/30/73. Jacob Harpootian (R-Dist. #86)
Provides for the creation of bicycle paths or roadways within state parks for the exclusive use of bicyclists.

VIRGINIA

H.J.R. 224. 1/22/73. J. Marshall Coleman (R-Dist. #15) (Senator)
Arthur R. Giesen, Jr. (R-Dist. #43) (Representative)
Directs the Dept. of Highways to conduct a study on the feasibility of establishing a system of bicycle trails throughout the Commonwealth, and to consider using a portion of state highway funds for this purpose.

H.B. 1805. 1/24/73. Vincent F. Callahan, Jr. (R-Dist. #18), David A. Sutherland (R-Dist. #18)
Adopts policy of establishing bicycle trails and footpaths wherever a highway, road or street is constructed, reconstructed or relocated, and provides for funds to cover construction and maintenance costs.

WEST VIRGINIA

S.B. 18. 2/14/73. Pat R. Hamilton (D-Dist. #11)
Authorizes the establishment of bicycle trails throughout the state, and the allotment of not less than two percent of total funds in the State Road Fund to accomplish this purpose.

Special Bikeway Legislative Summary

Write To Your Legislator: Support These Bills